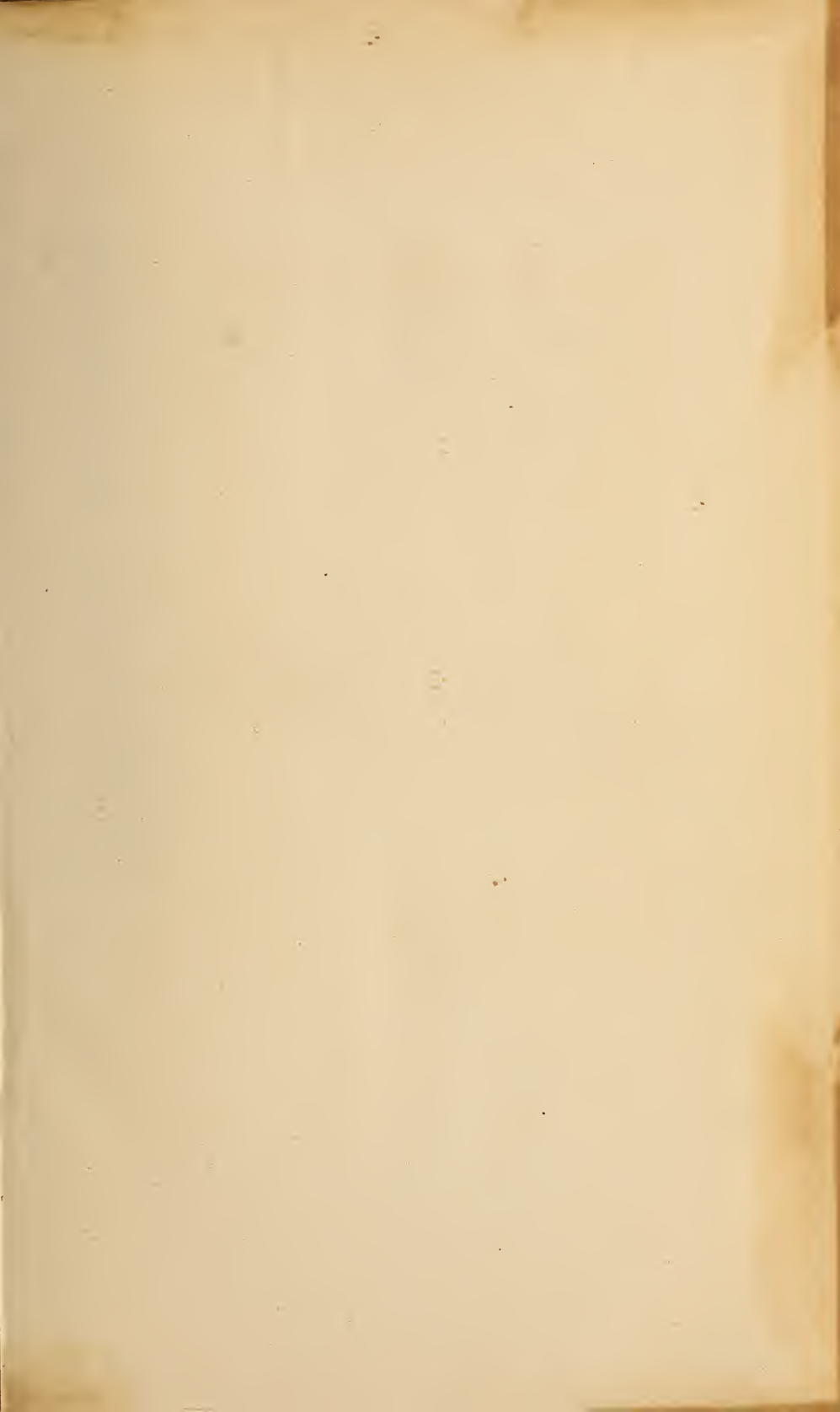






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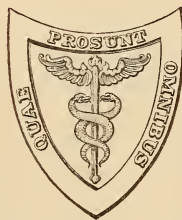


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TO READERS AND CORRESPONDENTS.

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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of February.

Liberal compensation is made for all articles used. Extra copies, in pamphlet form with cover, will be furnished to authors in lieu of compensation, *provided the request for them be made at the time the communication is sent to the Editor.*

The following works have been received for review:—

Ueber die Knochenbrüche bei Geisteskranken. Inaugural-Dissertation von Dr. Med. HUGO NEUMANN. Berlin: G. Bernstein, 1883.

Die Allgemeine Elektrisation des menschlichen Körpers. Electro-technische Beiträge zur ärztlichen Behandlung der Nervenschwäche (Nervosität und Neurasthenie) sowie verwandter allgemeiner Neurosen von SIGMUND THEODOR STEIN, M.D., etc. Zweite vielfach vermehrte Auflage. Halle, von Wilhelm Knapp, 1883.

Recherches Cliniques et Thérapeutiques sur l'Épilepsie, l'Hystérie, et l'Idiotie; Compte rendu du Service des Épileptiques et des Enfants idiots et arriérés de Bicêtre pendant l'année 1881, par BOURNEVILLE, Médecin de Bicêtre, Bonnaire (E.) et WUILLAMIE, Internes du Service. Paris. A. Delahaye et E. Lecrosnier, 1882.

Additions à la Traduction Française du Traité des Maladies des Reins de Bartels. Par R. LÉPINE, etc. Avec préface. Paris, Librairie Germer Baillière et Cie, 1884.

Goma Supurado en la Region Infra-hioidea. Por el Profesor RAMON DE LA SOTA Y LASTRA, M.D., etc., Reimpreso de la Revista Médica de Sevilla. Tom III. No. 33.

Contributo alla Disarticolazione dell'Omero. Dott. G. del Greco.

Phthisis: Its Cause, Nature, and Treatment: Being Part II. of the Antidotal Treatment of Disease. By JOHN PARKER, M.D., etc. etc. 16mo. London: David Bogue.

The Law of Sex: Being an Exposition of the Natural Law by which the Sex of Offspring is controlled in Man and the Lower Animals. By GEORGE B. STARKWEATHER, F.R.G.S. London: J. & A. Churchill, 1883.

Diseases of the Brain and Spinal Cord: A Guide to their Pathology, Diagnosis, and Treatment; with an Anatomical and Physiological Introduction. By DAVID DRUMMOND, M.A., M.D., etc. etc. etc. London: Henry Kimpton, 1883.

Elements of Practical Medicine. By ALFRED H. CARTER, M.D., etc. Second edition. London: H. K. Lewis, 1883.

Medical Diagnosis. A Manual of Clinical Methods. By J. GRAHAM BROWN, M.D., F.R.C.S. (Edinb.), etc. etc. Second Edition. Edinburgh: Bell & Bradfute. London: Simpkin, Marshall & Co., 1883.

Cholera: A Disease of the Nervous System. By JOHN CHAPMAN, M.D., M.R.C.P., M.R.C.S., etc. London: J. & A. Churchill, 1883.

Asiatic Cholera: Being a Report of an Outbreak of Epidemic Cholera, in 1876, at camp near Murree, in India. By CHARLES MOORE JESSOP, M.R.C.P., etc. London: H. K. Lewis, 1883.

Chemistry: Inorganic and Organic, with Experiments. By CHARLES LOUDON BLOXAM, Professor of Chemistry in King's College, London; in the Department of Artillery Studies, Woolwich, etc. etc. From the fifth and revised English edition. Philadelphia: Henry C. Lea's Son & Co., 1883.

The Pathology and Treatment of Venereal Diseases. By FREEMAN J. BUMSTEAD, M.D., LL.D., late Professor of Venereal Diseases at the College of Physicians and Surgeons, New York, etc. etc., and ROBERT M. TAYLOR, A.M., M.D., Professor of Venereal Skin Diseases in the University of Vermont, etc. etc. Fifth edition, revised and rewritten, with many additions by Dr. TAYLOR. Philadelphia: Henry C. Lea's Son & Co., 1883.

A Manual of Pathology. By JOSEPH COATS, M.D., Pathologist to the Western Infirmary and the Sick Children's Hospital, Glasgow; Lecturer on Pathology in the Western Infirmary, etc. etc. Philadelphia: Henry C. Lea's Son & Co., 1883.

Surgical Anatomy. By FREDERICK TREVES, F.R.C.S., Assistant Surgeon to the London Hospital, etc. etc. Philadelphia: Henry C. Lea's Son & Co., 1883.

Elements of Surgical Pathology. By AUGUSTUS J. PEPPER, M.S., M.B., F.R.C.S., etc. etc. Philadelphia: Henry C. Lea's Son & Co., 1883.

Principles of Theoretical Chemistry, with special reference to the Constitution of Chemical Compounds. By IRA REMSEN, Professor of Chemistry in the Johns Hopkins University. Second edition, thoroughly revised and enlarged. Philadelphia: Henry C. Lea's Son & Co., 1883.

A Treatise on Pharmacy. By EDWARD PARRISH, late Professor of Theory and Practice of Pharmacy in the Philadelphia College of Pharmacy, etc. etc. Fifth edition, enlarged and thoroughly revised. By THOS. S. WIEGAND, Graduate of the Philadelphia College of Pharmacy. Philadelphia: Henry C. Lea's Son & Co., 1883.

Epitome of Skin Diseases, with Formulæ, for Students and Practitioners. By the late TILBURY FOX, M.D., F.R.C.P., and by T. COLCOTT FOX, M.B., M.R.C.P. Third American edition, revised and with additions. By T. COLCOTT FOX, B.A. (Cantab.), M.B. (Lond.), Physician for Diseases of the Skin to the Westminster Hospital, etc. etc. Philadelphia: Henry C. Lea's Son & Co., 1883.

System of Human Anatomy: including its Medical and Surgical Relations. By HARRISON ALLEN, M.D., Professor of Physiology in the University of Pennsylvania. Section V., Nervous System. Philadelphia: Henry C. Lea's Son & Co., 1883.

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Clinical Chemistry. An Account of the Analysis of Blood, Urine, Morbid Products, etc., with an explanation of some of the Chemical Changes that occur in the Body in Disease. By CHARLES HENRY RALFE, M.A., M.D., Cantab., etc. Philadelphia: Henry C. Lea's Son & Co., 1883.

The Dissector's Manual. By W. BRUCE-CLARKE, M.A., M.B., F.R.C.S., etc., and CHARLES BURRETT LOCKWOOD, F.R.C.S., etc. Philadelphia: Henry C. Lea's Son & Co., 1883.

A Manual of Psychological Medicine and Allied Nervous Diseases: containing the Description, Etiology, Diagnosis, Pathology, and Treatment of Insanity, with especial reference to the Clinical Features of Mental Diseases, and the Allied Neuroses, and its Medico-legal aspects; with a carefully prepared Digest of the Lunacy Laws in each State relating to the Care, Custody, and Responsibility of the Insane. Designed for the General Practitioner of Medicine. By EDWARD C. MANN, M.D., Member of the New York Medico-legal Society, etc. Philadelphia: P. Blakiston, Son & Co., 1883.

The Physician's Visiting List (Lindsay & Blakiston's) for 1884. Thirty-third year. Philadelphia: P. Blakiston, Son & Co.

Sepulture: History, Methods, and Sanitary Requisites. By STEPHEN WICKES, A.M., M.D., etc. Philadelphia: P. Blakiston, Son & Co., 1884.

A Hand-book of Hygiene and Sanitary Science. By GEORGE WILSON, M.A., M.D., F.R.S.E., etc. Fifth edition, enlarged and carefully revised. Philadelphia: P. Blakiston, Son & Co., 1884.

Insanity considered in its Medico-legal Relations. By F. R. BUCKHAM, A.M., M.D. Philadelphia: J. B. Lippincott & Co., 1883.

A Practical Treatise on Materia Medica and Therapeutics. By ROBERTS BARTHOLOW, M.A., M.D., LL.D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College of Philadelphia, etc. Fifth edition, revised and enlarged. New York: D. Appleton & Co., 1883.

Cruise of the Revenue Steamer Corwin in Alaska and the Northwest Arctic Ocean in 1881. Notes and Memoranda: Medical and Anthropological, Botanical, Ornithological. Washington: Government Printing Office.

A Guide to American Medical Students in Europe. By HENRY HUN, M.D., Lecturer on Diseases of the Nervous System in the Albany Medical College. New York: Wm. Wood & Co., 1883.

The Medical Student's Manual of Chemistry. By R. A. WITTHAUS, A.M., M.D., Professor of Chemistry and Toxicology in the University of Buffalo. New York: Wm. Wood & Co., 1883.

The Physiological Factor in Diagnosis. By J. MILNER FOTHERGILL, M.D., F.R.C.S., etc. etc. 8vo. New York: Wm. Wood & Co., 1883.

A Manual of Practical Hygiene. By EDMUND A. PARKES, M.D., F.R.S., etc. etc. Edited by F. S. B. FRANCOIS DE CHAUMONT, M.D., F.R.S., etc. etc. Sixth edition, with an Appendix, giving the American Practice in matters relating to Hygiene. Prepared by and under the supervision of FREDERICK N. OWEN, Civil and Sanitary Engineer. Vol. I., 8vo. New York: Wm. Wood & Co., 1883.

A Treatise on Bright's Disease of the Kidneys, with chapters on the Anatomy of the Kidney, Albuminuria, and the Urinary Secretion. By HENRY MILLARD, M.D., A.M. New York: Wm. Wood & Co., 1884.

Treatise on Syphilis in New-Born Children and Infants at the Breast. By P. DIDAY. Translated by G. WHITLEY, M.D. With Notes and Appendix by F. R. STURGIS, M.D., etc. New York: Wm. Wood & Co., 1883.

A Treatise on the Diseases of the Nervous System. By JAMES ROSS, M.D., LL.D., etc. etc. Second edition, revised and enlarged. 2 vols. New York: Wm. Wood & Co., 1883.

Manual of General Technology, including Prescription-Writing. By EDWARD CURTIS, A.M., M.D., etc. etc. New York: Wm. Wood & Co., 1883.

Student's Manual of Diseases of the Nose and Throat. By J. M. W. KITCHEN, M.D., etc. etc. New York: G. P. Putnam's Sons, 1883.

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Documents with Reference to the proposed Building for the Army Medical Museum and Library of the Surgeon-General's Office.

Surgical Operations on the Pelvic Organs of Pregnant Women. By MATTHEW D. MANN, A.M., M.D., etc.

A Series of Twelve Ovariectomies. By MATTHEW D. MANN, A.M., M.D., etc.

On the Pathology of Phthisis Pulmonalis and its Laryngeal Complications. By CARL SEILER, M.D., etc.

An Examination of some Controverted Points of the Physiology of Voice, especially the Registers of the Singing Voice and the Falsetto. By T. WESLEY MILLS, M.A., M.D., F.R.C.P., etc.

Index to the Transactions of the American Medical Association. Vols. I.-XXXIII. Philadelphia, 1883.

In Memoriam. FRANCIS ASBURY ASHFORD, M.D.

The Classification, Training, and Education of the Feeble-minded, Imbecile, and Idiotic. By CHAS. H. STANLEY DAVIS, M.D.

The Physician's Daily Pocket Record, comprising a Visiting List, many useful Memoranda, Tables, etc. By S. W. BUTLER, M.D. New and thoroughly revised stereotype edition, with metric posological tables, etc. Edited by D. G. BRINTON, M.D. Philadelphia, 1884.

The Relation of Convalescent Institutions to Hospitals. By B. J. MASSIAH, M.D. London, 1883.

Diagnosis of Ovarian Tumours. By EDW. BORCK, A.M., M.D. St. Louis, 1883.

Our Eyes and Our Industries. By B. JOY JEFFRIES, A.M., M.D. Boston, 1883.

Ventilation. By JUSTIN M. HULL, M.D.

Rules and Regulations for Local Boards of Health. Prepared by the Iowa State Board of Health.

Health Laws of the State of Iowa. Compiled by the State Board of Health.

The Typhoid Fever of America: Its Nature, Causes, and Prevention. By R. J. FARQUHARSON, A.M., M.D., etc.

Some Recent Progress in Diseases of the Nervous System. By TALBOT JONES, M.D. St. Paul, Minn.

Relation of Eye and Spinal Diseases. By A. FRIEDENWALD, M.D., etc. Baltimore, Md.

On Malpositions of the Kidney. By DAVID NEWMAN, M.D., C.M.

Adherent and Contracted Prepuce, commonly called Congenital Phimosis. By DE FOREST WILLARD, M.D. Reprint from the Philada. Medical Times for June 30, 1883.

Memoir of JONATHAN LETTERMAN, M.D., Surgeon U. S. A., Medical Director of the Army of the Potomac. By Brevet Lieut.-Colonel BENNETT A. CLEMENTS, Surgeon U. S. A.

Medical Education and the Regulation of the Practice of Medicine in the United States and Canada. Illinois State Board of Health, 1883.

Delayed and Non-Union of Fractures, By N. SENN, M.D., of Milwaukee, Mich.

A Clinical Study of the Action and Uses of Caffeine and Convallaria Marialis as Cardiac Tonics. By BEVERLY ROBINSON, M.D., Professor of Clinical Medicine at the Bellevue Hospital Medical College, New York City.

Infusion of Jeqirity, or Licorice Bean, in Inveterate Pannus, with a Report of several Successful Cases. By EDWARD S. PECK.

Transactions of the Medico-Chirurgical Society of Edinburgh. Vols. I. and II., New Series. Session 1882-83. Edinburgh: Olivier & Boyd, 1883.

Transactions of the Academy of Medicine in Ireland. Vol. I. Edited by WILLIAM THOMSON, M.A., F.R.C.S., General Secretary, etc. 8vo. Dublin: Fannin & Co., 1883.

Transactions of the American Otological Society. Vol. III., Part 2. 1883.

Transactions of the Indiana State Medical Society, 1883. Indianapolis, 1883.

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 Transactions of the New Hampshire Medical Society. June, 1883.
 Transactions of the Medical Association of Georgia, 1883. Atlanta, 1883.
 Transactions of the Saint Louis Obstetrical and Gynæcological Society, 1882-83. St. Louis: James H. Chambers & Co., 1883.
 American Neurological Association. Ninth Annual Meeting, 1883.
 Transactions of the American Dermatological Association, 1883.
 Pennsylvania Pharmaceutical Association, Proceedings, 1883.
 The Wisconsin Pharmaceutical Association, Proceedings, 1883.
 Report of Proceedings of the Illinois State Board of Health. Quarterly Meeting, Chicago, October, 1883.
 Proceedings of the American Philosophical Society, January to April, 1883.
 Proceedings of the Medical Society of the County of Kings, Nov., Dec. 1883.
 Biennial Report of the Western Penitentiary of Pennsylvania for 1881-1882.
 Annual Report of the Supervising Surgeon-General of the Marine Hospital Service of the United States for the fiscal year 1883. Washington: Government Printing Office.
 Annual Report of J. L. MEARS, M.D., Health Officer of the City and County of San Francisco, for the fiscal year ending June 30, 1883, including reports of W. F. McALISTER, M.D., Quarantine Officer, etc. etc.
 Fourth Annual Report of the State Board of Health, Lunacy, and Charity of Massachusetts, 1883. Supplement containing the Report and Papers on Public Health.

The following Journals have been received in exchange:—

Bibliothek für Læger. Nordiskt Medicinskt Arkiv. Upsala Läkareförenings Förhandlingar. Kronika Lekarska. Annali Universali di Medicina e Chirurgia. Gazzetta degli Ospitali. Giornale Italiano delle Malattie Veneree. L'Indipendente. L'Imparziale. Lo Sperimentale. O Correio Medico de Lisboa. Cronica Medico-Quirurgica de la Habana. União Medica, Rio de Janeiro. La Union Medica, Caracas. Gazette Medicale de l'Orient. Allgemeine wiener medizinische Zeitung. Berliner klinische Wochenschrift. Centralblatt für die gesammte Therapie. Centralblatt für die medicinischen Wissenschaften. Centralblatt für Gynäkologie. Centralblatt für Chirurgie. Centralblatt für klinische Medicin. Deutsches Archiv für klinische Medicin. Deutsche medicinische Wochenschrift. Medicinisch-Chirurgisches Centralblatt. Medizinische Jahrbücher. Wiener med. Presse. Zeitschrift für physiologische Chemie. Annales de Dermatologie et de Syphiligraphie. Annales de Gynécologie. Annales des Maladies Genito-Urinaires. Annales des Maladies de l'Oreille, du Larynx, et des Organes Annexes. Archives de Médecine et Pharmacie. Archives de Neurologie. Archives Générales de Médecine. Bulletin Générale de Thérapeutique. Gazette Hebdomadaire. Gazette Médicale de Paris. Gazette Médicale de Nantes. Journal de Médecine de Paris. L'Abeille Médicale. L'Encéphale. Le Progrès Médical. L'Union Médicale. Revue de Chirurgie. Revue de Médecine. Revue de Thérapeutique. Revue des Sciences Médicales. Revue Internationale des Sciences Biologiques. Revue Médicale Française et Etrangère. Revue Mensuelle de Laryngologie. Revue Scientifique. Union Médicale et Scientifique du Nord-Est. Brain. Braithwaite's Retrospect. British Medical Journal. Dublin Journal of Medical Science. Edinburgh Medical Journal. Glasgow Medical Journal. Journal of Anatomy and Physiology. Journal of Physiology. Lancet. Liverpool Medico-Chirurgical Journal. London Medical Record. Medical Times and Gazette. Midland Med. Miscellany. Ophthalmic Review. Practitioner. Australian Medical Journal. Indian Medical Gazette.

The usual American exchanges have been received; their separate acknowledgment is omitted for want of space.

Communications intended for publication, and books for review, should be sent *free of expense*, directed to I. MINIS HAYS, M.D., Editor of the American Journal of the Medical Sciences, care of Henry C. Lea's Son & Co., Philadelphia. Parcels directed as above, and (carriage paid) under cover, to Messrs. Nimmo & Bain, Booksellers, No. 14 King William Street, Charing Cross, London, will reach us safely and without delay.

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The advertisement sheet belongs to the business department of the Journal, and all communications for it must be made to the publishers.

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2. Hand-Book for Hospitals. Issued by State Charities Aid Association. 12mo. pp. 263. New York: G. P. Putnam's Sons, 1883.	
3. The Relative Mortality after Amputations of Large and Small Hospitals, and the Influence of the Antiseptic (Listerian) System upon such Mortality. By Henry C. Burdett, Fellow of the Statistical Society; Late Secretary and General Superintendent of the Seamen's Hospital, Greenwich; the Queen's Hospital, Birmingham, etc. etc. 8vo. pp. 41. London: J. & A. Churchill, 1882	175
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XXIV. A Manual of Pathology. By Joseph Coats, M.D., Pathologist to the Western Infirmary and the Sick Children's Hospital, Glasgow; Lecturer on Pathology in the Western Infirmary; Examiner in Pathology in the University of Glasgow; Formerly Pathologist to the Royal Infirmary, and President of the Pathological and Clinical Society of Glasgow. With three hundred and thirty-nine illustrations. 8vo. pp. 818. Philadelphia: Henry C. Lea's Son & Co., 1883	233
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ARTICLE I.

A CASE OF SUPPOSED DISLOCATION OF THE TENDON OF THE LONG HEAD OF THE BICEPS MUSCLE.¹ By J. WILLIAM WHITE, M.D., Surgeon to the Philadelphia Hospital; and Assistant Surgeon to the University Hospital.

BEFORE proceeding to a description of the case which, by reason of its apparent rarity, it has seemed worth while to bring to the attention of the profession, it may be profitable, possibly not uninteresting, to review the history of the few other cases in which this same accident, luxation of the tendon of the long head of the biceps muscle, was supposed to have occurred.

The earliest mention of it in surgical literature seems to have been made in the first quarter of the last century, or thereabouts.

In the edition of the *Myotomia Reformata* of William Cowper, published thirteen years after his death by Richard Mead, at London, in 1724, appears the following description :—²

“ An extraordinary Case, relating to this Muscle, has more than once happened in our Practice. Particularly a Woman, three days before she consulted us, had (as she suspected) dislocated her Shoulder-Bone, by wringing of Linen Clothes after washing (which is commonly done, to express the Water), adding that, in straining her arms in that Action, she sensibly felt something (as she thought) slip out of its place on her Shoulder. After examining the Part, we were well satisfied that there was no Dislocation; but observing a Depressure on the external part of the Deltoid Muscle, and finding the two inferior Tendons of this Bicipital Muscle rigid, and the *Cubiti* thereby denied its due Extension, we sus-

¹ Read before the Philadelphia Academy of Surgery, Dec. 3, 1883.

² An Anatomical Treatise on the Muscles of the Human Body. Illustrated with Figures after the Life. By the late Mr. William Cowper (p. 75).

pected that the external tendinous Beginning (before taken notice of) was slipped out of its Chanel on the head of the *Os Humeri*; but finding the part at that time somewhat inflamed, we advised her to an emollient Application, and to give her Arm rest till the next day, at which time we found our Conjecture true; for by turning the whole arm to and fro, the Tendon readily slipped into its place, she recovering the use of the Part immediately."

Monteggia² (*Institutione Chirurgiche*, t. v. 179) describes the case

Of an aged woman, who fell, receiving a severe shock to the shoulder, followed by an acute pain which only ceased after she had felt "something" which was displaced return to its proper position. Afterwards she had a recurrence of this symptom from very trivial causes. Each time that she felt anew the localized pain, she would rest the hand of that side upon the shoulder of another person, and with the arm in that position, she felt the tendon of the long head of the biceps return to its position, and the pain disappeared.

Mr. William Bromfeild, Surgeon to her Majesty's Household, and to St. George's Hospital, in his *Chirurgical Observations and Cases* (London, 1773), says (p. 76):—

"I dare say many surgeons have seen a lameness in the shoulder from almost a similar cause, that is, the tendon of the *biceps* muscle, which runs in the excavated groove in the head of the *os brachii*, having by some turn of the limb, slipped out of the *sulcus*, and resting on one of the little exuberances of the upper part of the channel, till it returned, has occasioned, not only an immobility of the joint, but most violent pains. When the case is known, the reduction is very easy, for the cubit being bent the muscle is relaxed, and while an assistant holding the lower extremity of the *os brachii*, moves the head thereof, sometimes inward, sometimes outward in the *acetabulum scapulae*; the operator with his fingers will easily replace it, and the patient presently becomes perfectly easy."

In the one hundred years which have elapsed since worthy Mr. Bromfeild thus confidently expressed his views upon this subject, but very few if any cases have been reported, which on examination seem to belong beyond question to the class of injuries which he here describes.

The case of Mr. John Soden, of Bath, communicated to the Royal Medical and Chirurgical Society of London, July 6, 1841, by Richard Partridge, Esq., is the one which has excited most comment, as the symp-

¹ Mangetus, who died in 1742, at the advanced age of ninety, in his *Theatrum Anatomicum*, published at Geneva in 1717 (subsequent to the first edition of Mr. Cowper's treatise on the muscles), quotes the above case (pp. 39 and 40), together with some remarks on the "two inferior tendons" of the biceps, and on their relation to the operation of phlebotomy, all of which he translates, without the alteration of a word, into the scholarly Latin in which his work is written. He gives Mr. Cowper full credit, as is apparent from his opening sentence (see foot-note to page 53), in which he speaks of him as "Accuratissimus Anatomicus," etc.

Mr. Henry Hancock (*Provincial Medical and Surgical Journal*, 1844, vol. viii. p. 507), quoting the case of Mangetus (whom he calls Magnetus) from the *Encyclopædie Méthodique*, and that of Cowper from an edition published in 1737 by Albinus, at Leyden, very unjustly observes that these "two cases," as he calls them, so closely resemble each other that there can be little if any doubt that the one is an unacknowledged and pirated version of the other; and as Cowper is known to have appropriated Bidloo's anatomical plates, he suggests that he would not hesitate long in appropriating another man's case. An excellent illustration of the danger of quoting at second-hand!

² Quoted by Jarjavay, *Gazette Hebdomadaire*, May 24, 1867, p. 325.

toms during life were in this instance supposed to be explained by the result of the autopsy:—

A man aged 59, while falling backwards, placed his arm behind him and received the whole weight of his body on the right elbow. Acute pain in the shoulder was immediately experienced, and the man supposed that he had suffered either a fracture or dislocation, but, finding that he could raise the arm over his head, he felt reassured.

The next morning the joint was greatly swollen, tender to the touch, and painful on very slight motion. A severe sprain was diagnosed and antiphlogistic measures adopted, but at the end of three weeks the tenderness in front of the joint and pain on certain movements of the limb were scarcely less than on the day after the occurrence of the accident. Another careful examination was then made. On comparing the joint with its fellow, now that the swelling had subsided, a marked difference was observable between their respective outlines. The injured joint was manifestly out of drawing, without presenting any glaring deformity. When the man stood erect, with his arms dependent, the distinction was very manifest, but difficult to define. There was a slight flattening on the outer and posterior part of the joint, and the head of the bone looked as though it were drawn up higher in the glenoid cavity than it should be. Examination verified this appearance in two ways: 1st. On moving the limb, with one hand placed on the shoulder, a crepitating sensation was experienced under the fingers, simulating a fracture, but in reality, caused by the friction of the head of the humerus against the acromion. 2d. On attempting abduction, you found that the arm could not be raised beyond a very acute angle with the body, from the upper edge of the great tubercle coming in contact with the tip of the acromion. The head of the bone was unduly prominent in front, almost to the amount of a partial dislocation.

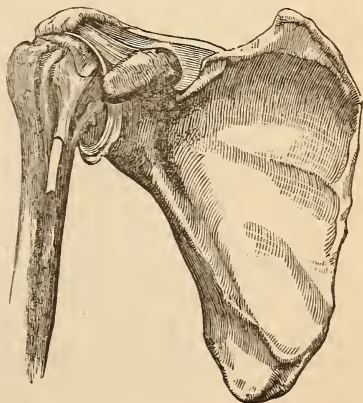
For all useful purposes the arm was powerless. The smallest weights could not be raised on account of the severe pain induced by any exercise of the biceps, which was described as very acute and extending through the whole course of the muscle, but felt chiefly at its extremities, the lower with the upper. When not excited by muscular action it was referred to the front of the joint and confined to the space between the coracoid process and the head of the humerus, which was marked by some puffy swelling. The patient being of a rheumatic habit, inflammatory action of that character was soon established in the joint, so that the peculiar symptoms of the injury were masked by those of general articular inflammation, which added greatly to the man's suffering and to the difficulty of diagnosis.

The patient found most relief from the elbow being well supported and placed close to the side, with pressure by a soft pad firmly applied against the deltoid muscle.

All this occurred in the month of May, 1839. In November of the same year the patient died of compound fracture of the skull, and an opportunity for an autopsy was afforded.

On examining the joint the accident was found to be a dislocation of the long head of the biceps from its groove, unaccompanied by any other injury (Fig. 1). The tendon was entire and lying inclosed in its sheath on the lesser tubercle of the humerus; the capsule was but slightly ruptured; the joint exhibited extensive traces of inflammation; the synovial membrane was vascular and coated with lymph; recent adhesions were stretched between different parts of its surface, and ulceration had commenced on the carti-

Fig. 1.



lage covering the humerus where it came in contact with the under surface of the acromion; the capsule was thickened and adherent, and in time probably ankylosis of the joint would have taken place.

In his remarks on this interesting case, Mr. Soden endeavours to explain the phenomena by attributing to the long head of the biceps the function of a capsular muscle. He remarks that the altered position of the bone must have been dependent on the displacement of the tendon, as the injury was uncomplicated; and continues: The head of the humerus is said to owe the security of its position rather to the combined action of the capsular muscles than to the ligamentous attachments of the humerus to the scapula; and the tendon is vaguely described as strengthening the joint, and in that respect having an analogy to the ligamentum teres of the femur. The capsular muscles may be considered as having their origin from the upper three-fourths of the circumference of a circle; they then converge towards its centre, represented by the head of the humerus, into the upper, anterior, and posterior parts of which they are inserted. In the lower segment of this circle there is a gap (the axilla) not occupied by muscles. As the head of the bone rolls on an almost flat surface, its position is entirely under the control of the capsular muscles; it follows, therefore, that to enable the bone to maintain its equilibrium these muscles should exactly antagonize each other or the head of the humerus would be drawn to the side of the preponderating muscle. The necessity of a muscle from the ribs to the humerus, to counteract the upper capsular muscles, is probably superseded by the singular course of the long head of the biceps. We can thus understand why, when the tendon is ruptured or displaced, the head of the bone should rise upwards and forwards—a precisely opposite direction to that in which the tendon would, when *in situ*, tend to direct it.

This case and Mr. Soden's remarks have been quoted by almost every writer on the subject since their publication. Bransby Cooper, in his edition of Sir Astley Cooper's Treatise on Fractures and Dislocations of the Joints (London, 1842), quotes it almost in full with seeming approval under the head of "Partial Dislocation upwards of the Shoulder-joint."¹ Mr. Pirrie under the same caption gives in his treatise on surgery an abstract of the case. He adds that in the museum of the Medico-Chirurgical Society of Aberdeen there is a preparation of an unreduced dislocation upwards which in all respects very closely agrees with the description and figure of Mr. Soden's case. The criticisms of other writers in this case will be given presently.²

¹ See Agnew, vol. ii. pp. 55-56, on those cases of so-called partial dislocation forwards and upwards, which he believes to be impossible, without fracture of the coracoid process.

² The second case of Mr. Soden was one of forward dislocation of the humerus attended with great difficulty in reduction. The patient died in a few days from internal injuries received at the time of the accident, and the autopsy disclosed the fact that

Dr. James S. Green reports a case (*Virginia Medical Monthly*, vol. iv. p. 106) of supposed luxation of the tendon occurring during muscular action. It was thought that in this case the tendon was preternaturally mobile (see *supra*, case of Monteggia), at least after the first of a series of accidents which took place as follows:—

In November, the patient, a large corpulent woman, aged 52 years, fell on a slippery step, injuring her shoulder. She was taken home in a carriage, on getting out of which she fell again and felt something—"the bone"—return to its place, upon which she was relieved. Ten weeks later, while attempting to drive a bird into its cage, striking at it over head with a newspaper, she was seized with violent pain in the same shoulder, and the arm fell to her side. The next day she had the following symptoms: Exquisite tenderness on the anterior and inner surface of the shoulder, over a space about a finger's width and finger's length in extent; abduction of the arm gave great pain; movement of the arm backward, either passively or by means of the latissimus dorsi, gave rise to the same pain which extended along the tract of the musculo-cutaneous nerve. This pain was constantly present as far as the external condyle of the humerus. Active flexion of the forearm upon the arm, to less than a right angle, gave most acute pain at the shoulder.

There were no symptoms of fracture or of scapulo-humeral displacement.

Partial relief from pain was obtained by keeping the arm close to the body and elevating it by a sling and bandage.

Ten days later, in an effort to save herself from another fall, she suddenly threw the injured arm upward and backward, when she "felt something return to its place with a snap," accompanied by agonizing pain. After this the symptoms all gradually disappeared.

From the study of the mode by which this spontaneous reduction took place, and of the symptoms of the case, Dr. Green recommends in the treatment of such cases, flexion of forearm, rotation of the hand outward, and the use of a sling.

Mr. G. W. Callender, in an article on Dislocations of Muscles and their Treatment (*The British Medical Journal*, July 13, 1878), wrote:—

"Perhaps of all tendons, those which have been most under notice are the biceps of the arm, and the conjoined tendon, which, through the patella, comes occasionally to be dislocated from the front surface of the femur. There is Dr. Hamilton's case of supposed dislocation of the biceps tendon; and in our London museums there are specimens showing displacement of the tendon of this muscle. It is not long since a woman was under our notice in Sitwell ward, who suffered from a hurt of this nature. I am very sorry we could do but little for her; but we did not see her until long after the first occurrence of her trouble. This woman had great pain with her hurt. The shoulder seemed to droop forward, and she shrank from using the biceps, and, indeed, from moving the joint. The tendon lay on the inner side of its groove, and by pressing against it so as to push it outwards, and by rotating the arm inwards, it would slip back into the groove, but only to slip out again, when the pain, which had been for the time relieved, was again felt. Of course continued rest was tried in the hope that the tendon would be resheathed in its groove, but it was not so; and the conclusion we came to was that the groove had become in part filled up, probably, by fibrous tissue;

the tendon had escaped and had slipped completely over the head of the bone, lying at the inner and posterior part of the joint.

No symptoms are mentioned except that the dislocation was "very high up." The difficulty in reduction was attributed to the complication of the injury to the biceps. "The inferences from the former case would lead us to expect that, had the tendon been *in situ*, it would have aided in the return of the bone; but its influence being removed the influence of the upper capsular muscles became doubled, and twice the amount of force was consequently required to overcome it."

or that the tendon could not lie and act in it without some binding down by a sheath; and as such ensheathing did not follow the reduction, the leader worked out so soon as any strain was brought to bear on it."

Laugier, Chirurgien de l'Hôpital Necker, has recorded (*Archives Générales de Médecine*, 2d series, vol. v. pp. 65, 66, 67) a case of "incomplete luxation of the head of the humerus upwards and forwards behind the coracoid apophysis,

In which, some days after an accident which was at first taken for a sprain of the shoulder, he found a slight depression beneath the acromion, a prominence of the head of the bone anteriorly, a shortening of the arm to the extent of five or six lines, and a difficulty in abduction of the humerus, the movement being accompanied by an equal movement of the scapula. There had been at no time the signs of a fracture or dislocation. Attempts at reduction were made, but were unsuccessful."

Mr. Alfred Mercer (*Buffalo Med. and Surg. Journal*, vol. xiv. p. 641) relates the following case:—

"Mrs. B., a well-developed woman, of full habit, aged fifty-six, seven years since was thrown from a carriage, dislocating her right shoulder, which was reduced a short time after the accident, but the shoulder was painful, and tender to the touch, and almost useless for months after. She could carry the arm forwards and backwards, but could not raise it from the side, or carry the hand behind her, or raise it to her head for fourteen months. She has gradually gained better use of her arm, but now, July, 1858, she cannot raise her elbow from the side more than half-way to a horizontal position without assistance; but with assistance the arm may be carried into any position without pain or resistance. Measurement shows no appreciable difference in the size or length of the arm or size of the shoulder; but the point of the shoulder is still tender to the touch, is prominent in front, and correspondingly flattened behind. The head of the humerus appears to rest against the outside of the coracoid process, but the fulness of habit obscures the diagnosis compared with the other cases. Several doctors at different times have examined the shoulder; some have said it was not properly reduced, and advised a suit for malpractice.

"I examined the shoulder again in November last; it presented the same general appearance, although the patient was much thinner in flesh, from recent sickness. Some six weeks previous to this examination, in a sudden and thoughtless effort to raise the arm above the head, the muscles unexpectedly obeyed the will; since which time she has had perfect use of it, though the deformity still remains. She thinks she felt or heard a snap when the arm went up, but it was followed by no pain, soreness, or swelling."

There can be no doubt, we think, adds Dr. F. H. Hamilton, that in this case, at least, the deformity and maiming were due, in a great measure, to a displacement of the long head of the biceps.

Mr. Henry Hancock, Surgeon to Charing Cross Hospital, wrote as follows (*loc. cit.*) in reference to this dislocation, but describes no particular case:—

"The principal signs of this accident are pain and tenderness in front of the joint, corresponding to the bicipital groove; acute pain in the course of the biceps, when it is thrown into action, the pain being referred more particularly to its two extremities; the patient is unable to raise his hand to his head, or his arm beyond an acute angle from his body; the appearance of the shoulder is somewhat altered, the head of the humerus being drawn upwards, and more forward than natural, lying close beneath the acromion process, while the posterior and external part of the joint is somewhat flattened. When we consider how much

in appearance these accidents resemble partial dislocations of the humerus upward and forward, we can entertain but little doubt that they have frequently been mistaken for them." "I am not aware of any particular symptom by which we can be guided with any certainty as to when the tendon is dislocated inward, or when outward; but, as a result of my experiments, I should imagine that it is more frequently dislocated inward than outward, the inclination of the head of the humerus, and the greater projection of the large tubercle being unfavourable to the latter displacement."

These clinical cases were long ago supplemented, and were supposed to be confirmed by the reports of dissections in which dislocation of the tendon of the biceps was found associated with other pathological conditions of the shoulder-joint. For example, in the *Medical Gazette* for May 24, 1835, Mr. John Gregory Smith reported seven cases of injury of the shoulder-joint as observed in the dissecting-room. The pathological changes which have any bearing on the present paper, may be enumerated as follows, it being understood, of course, that no clinical histories were obtainable:—

CASE I. The bursa beneath the deltoid was much enlarged and thickened, and communicated with the general cavity of the joint by a large, irregular opening. The tendons of the scapular muscles were completely detached from the greater and lesser tuberosities. The tendon of the long head of the biceps had been torn away from the upper part of the glenoid cavity, and entirely withdrawn from the joint; it was found to be firmly attached to the anterior margin of the bicipital groove. The head of the humerus moved freely in all directions on the glenoid surface of the scapula.

CASE II. Sub-deltoid bursa as above; tendon of subscapularis detached; tendon of long head of biceps ruptured; attached to margin of bicipital groove.

CASE III. Tendons completely torn from greater tuberosity; that of subscapularis partially detached; tendon of long head of biceps torn; attached to bicipital groove.

CASE IV. Bursa beneath deltoid as above; tendons of subscapularis and supra-spinatus detached; tendon of long head of biceps torn from the upper part of the glenoid cavity; attached to bicipital groove; the portion of the belly of the biceps pertaining to the long head was remarkably short, the short head being unusually developed.

CASE V. Sub-deltoid bursa as above; partial separation and detachment of the supra-spinatus and subscapularis muscles from the larger and lesser tubercles; tendon of the biceps torn.

CASE VI. Bursa as above; tendon of subscapularis and supra-spinatus detached; fibres of infra-spinatus and teres minor appear to have suffered severe tension; tendon of the long head of the biceps displaced from its groove, but not separated from its origin; it lay loose in the inner part of the cavity of the joint; the capsular ligament had been much stretched and readily allowed the head of the humerus to be displaced so as to rest upon the inner margin of the glenoid cavity.

CASE VII. Bursa very large, parietes thickened, separated from cavity of joint by a thick layer of lymph. Head of bone freely movable, and easily drawn to inferior margin of glenoid cavity; tendon of subscapularis detached; tendons of supra- and infra-spinatus attached, but the fibres of these muscles had evidently been much stretched; tendon of the long head of the biceps permanently displaced from the bicipital groove, and lying at the inner and lower part of the joint, playing over a smooth part of the lesser tubercle.¹

¹ Cases VI. and VII. represent the two shoulder-joints of one individual, as did also Cases IV. and V.

Mr. Edward Stanley, in the *London Medical Gazette* for 1829 (vol. iii. p. 12), wrote :—

“ In two instances I have found, upon dissection, the tendon of the biceps separated from the edge of the glenoid cavity, and firmly adherent to the margin of the bicipital groove; but there was no other unusual appearance of the parts, either in or about the joint. In a third instance, I found the tendon of the biceps dislocated from its groove, and resting upon the great tuberosity of the humerus. A membranous sheath attached to the humerus, and extending around the tendon, confined it in its new situation. This sheath was polished on its internal surface, it seemed for the purpose of facilitating the play of the tendon, and its formation may be presumed to have been analogous to that of the capsule inclosing the ends of a fractured bone.”

These cases will suffice as examples of this sort of evidence, that obtained at autopsies and unassociated with clinical histories. They, as well as their predecessors, have met with scant mercy at the hand of their critics.

Pouteau, who believed that he had established the occasional dislocation of muscles from their aponeurotic sheaths, asks himself (*Mélanges de Chirurgie*, p. 433) if it is possible for tendons to become thus displaced, and, after some expression of doubt, declares that he is forced to the conclusion that, during the energetic contraction of muscles, the tendons themselves would break rather than their sheaths.

Mons. J. F. Jarjavay, Professeur à la Faculté de Médecine, chirurgien de l'hôpital Beaujon, etc., published in 1867 (*Gazette Hebdomadaire*, Nos. 21 and 23) a paper on this subject. After alluding to the cases of Bromfeild, Cowper, Monteggia, Stanley, Smith, and Soden, he sums up, not altogether correctly, the symptoms observed by the first three of them as follows :—

An acute pain in the point of the shoulder during a violent twist of the arm; a sensation of displacement in that region, giving rise to the belief on the part of the patient that a luxation of the humerus has occurred; a greater or less difficulty in the movements of the scapulo-humeral articulation; a variable degree of inflammation; a well-pronounced bruit heard on moving the arm; rigidity of the biceps with flexion of the elbow; a sensation of reduction following movements of rotation imparted to the head of the humerus. This group of symptoms, he says, has led the authors in question to diagnose a luxation of the biceps tendon, but he considers the proof of such a lesion to be entirely wanting. He adds that there is no doubt, however, that patients present themselves after violent strains of the shoulder, with acute pain and immobility of the joint, with a sensation of fatigue about the lower portion of the biceps, with a feeling of something displaced, and with a marked bruit produced by rotating the arm, but that these phenomena are due to a lesion altogether different from luxation of the tendon. In proof of this he reports five cases of injury of the shoulder which may be summarized as follows :—

CASE I. A man, aged 25 years, in order to carry a heavy bag of sand on his left shoulder, steadied it with his right hand passed behind and above his head. While he was raising it into this position he felt a sudden pain at the point of the shoulder, and the arm became powerless and fell suddenly by the side of the trunk. Three days later he presented the following symptoms: Slight swelling of the right shoulder; forearm flexed on arm; immobility produced by the pain of movement; pain over lower portion of the biceps on which the skin above the elbow is tense; pain in extending the forearm. He could carry the arm feebly forward, backward, and inward, but abduction to a slight extent caused severe pain. Rotation of the humerus with the arm at the side was noiseless, with the arm abducted until it was horizontal was associated with a species of *claquement*, which could be plainly heard by the surgeon and his assistants. If

the arm were then abandoned it would fall to the side with a sudden pain and noise resembling the reduction of a luxation. The same phenomena could be reproduced repeatedly. If, during the rotation of the humerus held horizontally, an assistant pressed downwards its upper extremity, the noise ceased.

All these symptoms greatly diminished in a few days under the use of cold lotion and a sling. Nine days after the accident the sling was discarded and movements of the arm were good.

CASE II. A man, 56 years of age, while drawing powerfully on a corkscrew, had an acute pain in the shoulder. Eight days afterwards, when he was first seen, he had painful abduction, creaking on rotation, etc. (as in Case I.), flexion of the forearm, etc. No swelling or tenderness. Nearly well in three days.

CASE III. A woman, 47 years of age, fell and twisted her right arm, producing a sharp pain in the shoulder. The symptoms were the same as the above. No pain except during abduction, when it was acute and associated with the creaking noise. She returned to her work quite well in three days.

CASE IV. A man, 23 years of age, fell on his right hand, wrenching his shoulder. The same symptoms followed—moderate swelling of the shoulder, but no deformity and no ecchymosis. Four days later all the swelling had disappeared and much of the pain. In three weeks he was entirely cured.

CASE V. A man, 27 years of age, and entirely without any history of traumatism, presented himself with a swollen reddened shoulder, with painful rotation of humerus, a slight creaking, etc. A puncture beneath the tip of the acromion was followed by the escape of about two teaspoonfuls of clear serum. This was repeated two or three times—other treatment was applied, and the patient was almost well in six weeks.

These cases have the following characteristics which distinguish them, according to M. Jarjavay, from other injuries about the shoulder, and which establish the fact that they were not due to a luxation of the bicipital tendon. 1. They were all produced—except Case V.—by a twist of the arm. 2. The seat of the pain (as in the cases of Cowper, Bromfeild, and Monteggia) was at the external aspect of the point of the shoulder, on a line with the tip of the acromion. 3. The long tendon of the biceps is at least two and a half centimetres within this point. 4. The pain and the noise are synchronous, and are manifested only at the moment when the arm is carried into abduction, and is sufficiently elevated for the great tuberosity to glide under the tip of the acromion, or is rotated, while in that position. 5. Case V. shows that an acute hygroma of the sub-acromial bursa may produce all these symptoms. 6. If we examine this bursa we find that movements of tension distend or crumple up its walls; if the deltoid muscle is detached from its insertion and turned upwards over the acromion and clavicle, and the humerus is abducted, it will be seen that the walls of this bursa are folded upon themselves, and form a pad or cushion beneath the tip of the acromion, and that at the moment the humerus reaches the horizontal, the tuberosity glides under the acromion, pushing these folds of the bursa before it.

Bearing these clinical and anatomical facts in mind, M. Jarjavay comes to the following conclusions, which refer to his own cases and to those of Cowper, Bromfeild, and Monteggia.¹

¹ Those of Stanley and Gregory Smith observed post mortem only, he attributes to previous luxation. As to that of Soden he agrees entirely with Malgaigne, whom he quotes.

1. Simple luxation of the long tendon of the biceps muscle does not exist, or at least has never been demonstrated.

2. The lesion which has been considered to be a luxation of this tendon, has its seat in the sub-acromial serous sac.

3. This lesion is an inflammatory enlargement, caused by contusion or laceration of this sac, or by hypertrophy, with induration of its walls and fibrous transformation of its cellular partitions, consecutive to inflammation.

4. Its symptoms are the following: Sensation of displacement at the time of the accident; swelling of the shoulder; pain preventing movements of the arm, principally those of abduction; forearm flexed upon the arm, and consequent rigidity of the biceps muscle and a feeling of uneasiness in the front of the elbow; increase of pain, and bruit below the acromion when the arm is raised and abducted, and the greater tuberosity is made to glide under this apophysis (the bruit is a crackling sound, and gives the sensation of a reduction of something displaced; it is reproduced whenever the bone maintained in a horizontal position is rotated); relief of pain, and restoration of the movements of the arm after rest; habitual persistence of the crackling bruit, even when the pain is no longer felt, and the movements are free.

Malgaigne (*Traité des Fractures et des Luxations*, Paris, 1855, t. ii. pp. 565-66-67) makes the following criticism upon Mr. Soden's cases, prefacing it with a few remarks upon the so-called upward luxation, which are so pertinent to the case I am about to describe, that I translate them also:—

It is not rare to observe in *scapulargies*, which have become chronic, a *sub-luxation upward and forward*, which has acquired a certain importance on account of the mistakes to which it has given rise. I have shown many examples of it at my clinics. The humeral head is elevated until it is almost in contact with the acromion, and is carried forward against the external border of the coracoid process; there is found, in consequence, a slight depression under the acromion, shortening of the arm and limitation of its movements. It is really this condition, unless I am mistaken, which M. Laugier has described as an incomplete upwards and forwards luxation, produced by traumatism. (See p. 22.) His patient, after a twist of the shoulder, had pain and swelling. M. Laugier, after a careful examination, diagnosed at first only a sprain. At the end of twelve days, however, the swelling had largely disappeared, and he then perceived that the head of the bone was prominent at the front and inner side of the joint near the coracoid process, and was somewhat elevated, the arm being shortened five or six lines.¹ M. Avrard has observed a displacement of the same character, dating back thirty-one years, and following a fall upon the shoulder. The head occupied the space included between the coracoid, the acromion, and the glenoid cavity, into which it could not be brought again. The arm was shortened from eight to ten millimetres; abduction was arrested at 30° by the impinging of the great tuberosity upon the point of the acromion, and all the movements of the joint were greatly restricted.²

That which deceived these two observers was the traumatic cause of the affection; I have myself for a long time sought to explain their observations by a traumatic lesion. J. Soden, in England, having been able to study an analogous case with the scalpel, came to the conclusion that it was a luxation of the long tendon of the biceps. His patient, after a fall on the elbow, felt a sharp pain in the shoulder, and fearing a fracture or a luxation, was only reassured by finding that he could raise the arm above his head. The next day the shoulder was swollen, and elevation of the arm had become impossible. Soden was called in, found no displacement, and treated the case as a sprain. Finally, at the end of three weeks, the swelling having subsided, it was found that the head of the humerus was unnaturally prominent in front and above. There was still pain in the joint, and elevation of the arm appeared to be prevented by contact between

¹ Arch. Gén. de Méd., 1834, t. v. p. 65.

² Revue Méd.-Chir., 1878, t. iv. p. 282.

the great tuberosity and the acromion. Five months later the patient died of a head injury. *The joint showed numerous traces of inflammation, the synovial membrane was unduly vascular and covered with lymph; there were recent adhesions between different points of its surface; the cartilage of the humeral head, where it was in contact with the lower surface of the acromion, was ulcerated; the capsule was thickened and adherent.*¹ Finally, the tendon of the biceps was displaced from its groove without other lesion.

A figure accompanying this description (see Fig. 1) seems to complete it. The head is actually elevated in the glenoid cavity; at the inferior portion of which a little space is left empty. The tendon occupying the greater part of its sheath, has simply dilated it above, in such a manner as to deviate a little in the direction of the lesser tuberosity. A deviation to that extent is not necessarily traumatic; and besides it would not explain the ascension of the humerus, which can readily be accounted for by the pathological retraction of the ligaments. On the other hand, this ascension might well have been the determining cause of the deviation of the tendon, forced to slip forwards in order to reach its glenoidal insertion by the shortest path. I have seen and shown at my clinic, many cases of the same character, and have come to a definite conclusion in reference to them. There has never been a traumatic luxation of the tendon of the biceps, otherwise than as a complication of a fracture or luxation; there cannot be a traumatic luxation which holds the head at the external side of the coracoid process; but there is a pathological sub-luxation of the humerus, due to articular inflammation and to retraction of ligaments, favoured, perhaps, by mal-position, or improperly applied dressings.

The criticisms of Mr. Robert Adams on the case of Mr. Soden, in his article on Abnormal Conditions of the Shoulder-Joint (*Cyclopædia of Anatomy and Physiology*, vol. iv. p. 595), seem to me worthy of great consideration. He had previously shown: 1. That one of the commonest conditions in chronic rheumatic arthritis of the shoulder-joint was atrophy or degeneration of the bicipital tendon which was often absent from the joint. 2. That in these cases the humerus has a very general tendency to pass upward towards the coraco-acromial vault, and that besides the removal of the biceps tendon the superior part of the capsular ligament is also observed to be deficient. 3. That these changes, as demonstrated in autopsies, frequently affect *both* shoulder-joints (see Cases VI. and VII. of Mr. Smith); but are described by writers, who (with the one exception of Mr. Soden), knew nothing of the clinical histories of their cases, as "rupture of the tendon of the biceps," an accident in the highest degree unlikely to occur symmetrically. 4. That so long as the long tendon of the biceps remains in its state of integrity, arching over the head of the bone, and then passing in a perpendicular line down along the humerus, the head of this bone cannot be partially elevated above its normal situation, nor even drawn inwards or backwards by either of the great muscles which form the anterior or posterior walls of the axilla; but that when the long tendon of the biceps is destroyed or dislocated, then the head of the humerus may be moved in whatever direction the inclination of the new plane formed by the altered surface of the glenoid cavity may give, or the muscles may draw it in. 5. He had given also the results of a post-mortem examination in a case of chronic rheumatic disease in a patient of Mr. Robert

¹ The Italics are Malgaigne's.

Smith, in which there was no history of accident. The head of the humerus was displaced upwards; the capsular ligament was deficient superiorly; the tendon of the biceps was perfect, but was thrown off the head of the bone inwards;¹ and, 6. Had given in addition the details of an autopsy in which almost the same displacement of the head of the humerus and tendon of the biceps, as in Mr. Soden's case, were found in *both* shoulder-joints, associated with the ordinary anatomical characters of chronic rheumatic arthritis.

Examining Mr. Soden's case in the light of these facts, it is important to observe: 1. That the patient was a man 59 years of age, "of a rheumatic habit," and that "inflammatory action of that character was soon established in the joint," etc. 2. That he at first supposed he had either a fracture or dislocation, but, finding that "he could raise the arm over his head," he felt reassured, and tried to resume his work. It would appear to us, says Mr. Adams, that if the tendon of the biceps were accidentally dislocated, the patient would not be able, immediately after the accident, to raise his arm over his head. 3. That the first symptoms were simply those of an inflammatory character, or, as Mr. Soden then supposed, of a severe sprain. 4. That the later symptoms; the flattening of the outer and posterior part of the joint; the elevation of the head of the bone; the crepitation, the pain along the biceps, the difficulty in abduction, the prominence of the head of the bone in front, all belong to an early stage of chronic rheumatic arthritis of the shoulder. 5. Dr. Macdowell (who examined the specimen for Mr. Adams) reported to him that "the head of the humerus is considerably enlarged, and that the long tendon of the biceps, which has been dislocated internally, is in a state of atrophy."

The criticism directed against the clinical aspects of these cases has been strongly reinforced by observations on disease of the shoulder-joint, particularly chronic rheumatic arthritis, which showed that many cases of dislocated tendon, discovered post mortem, and supposed to be the result of injury, were really due to disease.

Dr. Knox, of Edinburgh (quoted by Callaway), seems to have been the first person to notice a morbid condition of the tendon of the biceps. He found in the dissecting-room four cases in which the tendon had more or less disappeared, in one case altogether. In the others it was reduced to a few cellular and fibrous-looking threads, which could be traced with difficulty.

¹ "The great peculiarity in this case, Dr. Smith thought, consisted in the circumstance that the tendon of the biceps was not, as it usually is in cases of this chronic disease, absorbed, but was in a perfect state of integrity, as to structure. This tendon having been thrown off the head of the humerus and displaced inwardly, its normal function to restrain the ascent of the humerus through the medium of its muscular connection was as much annulled as if it had been removed altogether, as it usually is under the influence of this chronic disease."

Mr. Hargraves reported (*Edinburgh Journal*, 1837), a case of "partial dislocation" of the humerus in which the biceps tendon was ruptured. Sir Astley Cooper's case has already been referred to. In this the tendon was thought to have been ruptured, but to have again united. Mr. Callaway thinks (op. cit., p. 151), that he must have meant "united to the capsule of the joint."

Mr. Stanley (*Medical Gazette*, vol. iii. p. 12), says that in one instance he found the tendon of the biceps dislocated from its groove and resting on the great tuberosity of the humerus. A specimen (No. 55) in the museum of St. Bartholomew's Hospital is an example of dislocation (Callaway, op. cit., p. 145).¹

Mr. Canton (*London Med. Gazette*, 1879, vol. viii., 3d series, p. 958) reports a case of chronic rheumatic arthritis of the right shoulder, in which the long tendon of the biceps was flattened and expanded, "permitting the head of the humerus to shift upward and thereby to articulate with the under surface of the acromion process."

Among the most important papers bearing upon this subject with which I am familiar, are those published by Dr. Robert W. Smith, Professor of Surgery in the University of Dublin (*The Dublin Quarterly Journal of Medical Sciences*, 1853, vol. xv. pp. 1, 343), under the title "Observations upon Chronic Rheumatic Arthritis of the Shoulder."

Having detailed the pathological appearances of this disease, and illustrated them by a case of his own, he proceeds to review the various cases which have from time to time been recorded in surgical literature as instances of rupture or dislocation of the biceps tendon, partial luxation of the humerus upwards, etc., beginning with Mr. John Gregory Smith's series of cases (see p. 23). He says:—

"It would be difficult to lay before the reader any more striking examples of the anatomical characters of chronic rheumatic arthritis of the shoulder than those furnished by the preceding group of cases, gratuitously described by the author (for their history was unknown) as instances of the effects of accidental violence. The absorption of a portion of the capsule; the detachment of the tendons of the capsular muscles from the tubercle of the humerus; the separation of the acromion into two portions; the ivory-like deposit upon the surface of the bones; the loss of the tendon of the biceps; its adhesions to the bicipital groove; *its displacement inwards from the summit of the humerus*; the osseous nodules about the tubercles; the conversion of these processes into articular surfaces; the enlargement of the capsule; the symmetrical development of the disease,² etc. etc., are elucidated in the clearest manner by this series of specimens."

¹ Mr. Stanley found that in a case which he supposed to be rupture of the biceps tendon, the slightest movement of the elbow backwards was followed by acute pain, precisely in the situation where the tendon of the biceps turns over the head of the humerus. There was also effusion of blood into the subcutaneous cellular tissue, but confined to the tract of the biceps tendon. In a similar case occurring in the practice of Mr. Normald it was observed that "the effort of bending the forearm was attended with a peculiar spasmodic and vibrating movement of that part of the biceps from which the long head is continued, and which was distinctly felt by the hand placed against the arm."

² Cases 4 and 5 occurred in the same person, as did also Cases 6 and 7.

Professor Fergusson's statement that partial luxation of the head of the humerus upward occurs pretty frequently, his opinion being grounded upon phenomena observed in the dissecting-room (see p. 34), he believes to be erroneous, and attributes it to the same cause: "In the remarks which he has made upon the subject, he has unknowingly described many of the leading features of chronic rheumatic arthritis of the shoulder, although he looks upon them as resulting from accident." Mr. Hilton's case¹ (*Guy's Hospital Reports*, vol. v.) and Mr. Alfred Smee's² (*The Lancet*, 1845, vol. i. p. 323) are interpreted by him in the same manner. He disposes similarly of the cases of Mr. Barron³ (*London Med. Gazette*, vol. xx. p. 554), of Dr. Knox (*Ibid.*, vol. i.), of Mr. Stanley (*Ibid.*, vol. iii.), of Sandefort (*Museum Anatomicum*, vol. iv., tab. cli.), of Mr. Callaway (see p. 35), and of Sir Astley Cooper (see p. 20), all of which were reported as partial dislocation of the shoulder upwards, or as instances of rupture or dislocation of the bicipital tendon, and all of which, as he clearly shows, presented marked evidence of chronic arthritis. In none of them was there any satisfactory clinical history, the diagnosis having been founded, chiefly if not entirely, on post-mortem appearances.

Of Soden's case he says:—

"It has been clearly demonstrated that the fall alluded to in the history of the case had only this much to do with the partial displacement upwards of the head of the humerus which succeeded to it, that this accident became the starting-point of an inflammatory action of a rheumatic character, under the influence of which the head of the bone became elevated to the acromion process and the tendon of the biceps displaced."

He then describes the case of an elderly female, who had for many years suffered from chronic rheumatic arthritis of the right shoulder-joint, which, after death, was examined by him. The head of the humerus was displaced upwards, and the tendon of the biceps, perfect as to structure, crossed the inner instead of the upper surface of the head, the cartilage of which was abraded. The case of Charles Mailly, recorded by

¹ Dislocation downwards of the humerus into the axilla, associated with rupture of the tendon of the biceps.

² Dissection of a partial dislocation of the shoulder upwards. There was detachment of the biceps tendon from the edge of the glenoid cavity. Mr. Smee says: "Regarding the total alteration in the joint, arising from the injury, as a whole, we find that the shoulder-joint was converted into a double joint, one joint existing between the head of the bone and the glenoid cavity, the other between the great tuberosity and the under surface of the acromion." After study of the case he comes to the following conclusions: "First, that the tendon of the biceps is sufficient alone to keep the head of the bone from rising from its situation, or, at any rate, contributes principally to that object. Secondly, that the supra- and infra-spinati have no influence in drawing the head of the humerus under the acromion, as it was drawn into that situation when these muscles were divided."

³ Detachment of the biceps tendon from the glenoid cavity. Mr. Barron and Mr. Pilcher met with this condition frequently in dissecting-rooms, especially in aged females.

Mr. Adams (see page 27), illustrates the same displacements of the head of the humerus and of the tendon, occurring in *both* shoulder-joints (as in Cases VI. and VII. of Mr. J. G. Smith's series).

He continues :—

“The remarkable elevation of the head of the humerus to which the name of ‘partial luxation upwards’ has been given has invariably been ascribed to the destruction or displacement of the tendon of the biceps, not only by those who look upon it as the result of external injury, but also by those who, in my opinion, correctly refer it to the effects of chronic rheumatic arthritis. Mr. Adams, for instance, observes that ‘the effects of the loss of the tendon of the biceps are such that the head of the humerus is at once elevated by the deltoid and kept habitually pressed up against the under surface of the acromion.’¹ The correctness of this opinion certainly admits of being questioned, and I am inclined to believe that in the cases under consideration the cause has been mistaken for the effect. I do not mean to say that the accidental rupture or displacement of the biceps in a healthy shoulder-joint would *not* be followed by the elevation of the head of the humerus, but I suspect that in cases of partial luxation upwards resulting from the rheumatic disease in question the sequence of events is different from that observed by authors. I believe that in these cases the elevation of the head of the humerus occurs at a comparatively early period of the disease, and is a gradual process, and that the displacement is not in any instance sudden, as might be expected to happen were it consequent upon the rupture or dislocation of the tendon.”

He believes the sequence of phenomena is as follows: Spastic contraction of the muscles under rheumatic irritation of the joint; elevation of the head of the bone; pressure against the tendon of the biceps; displacement inwards of the tendon which slips over the smooth globular head of the humerus until the tension is somewhat relieved; later should the tendon not atrophy under pressure the extra-capsular portion may become implicated, and will be found crossing the lesser tubercle.

Dr. Smith concludes his elaborate paper as follows :—

“A long and careful consideration of the subject discussed in the preceding pages leads me to believe that the occurrence of partial dislocation of the head of the humerus upwards, as an immediate result of rupture or displacement of the tendon of the biceps muscle from accidental violence, has not been anatomically demonstrated; that all the cases accompanied by dissections that have hitherto been published, as examples of the luxation in question, resulting from injuries to the tendon, have, in reality, been instances of the effects of chronic rheumatic arthritis; and that the morbid conditions which in them have been regarded as affording the clearest evidence of the joint having at some former period suffered from external violence, are among the most constant effects of this disease.”

Dr. A. G. Gerster, of New York, in an article on Subcutaneous Injuries of the Biceps Brachii (*New York Medical Journal*, 1878, vol. xxvii. p. 487), refers to injuries and dislocations of the tendon of the muscle, as follows :—

¹ Mr. Canton also, in his description of a case of this disease, brought under the notice of the Westminster Medical Society, and in which the tendon was divided into four or five slips, remarks that “this condition of the tendon had permitted the head of the humerus to shift upwards, and thereby to articulate with the under part of the acromion process.”

"There are cases where the tendon of the long head is but partially lacerated, or in which it is intact, its sheath only being injured. These changes have been for a long time the diagnostic stumbling-blocks of many surgeons. The changes in the outward shape of the shoulder are very slight indeed in these cases; you find, perhaps, a scarcely noticeable synovial effusion in the joint, sometimes an ecchymotic streak in the front of the shoulder; but the functional disturbance is very marked, in fact it seems to be out of proportion with the visible anatomical changes. The patient is unable to use his arm, and endeavours with earnest care to keep it in the same well-flexed condition as if the humerus were broken.

"Passive extension, as well as flexion, of the pronated forearm, causes some pain, active extension and flexion in the same position possible, but a good deal more painful; active flexion of the forearm in supination quite impossible. By pressing the finger tips against various points of the humerus, palpation along the bicipital sulcus, especially between the two tubercles, elicits marked signs of distress."

Dr. Gerster then quotes the case of a carpenter, æt. thirty-five, who fell down a staircase and "struck the ground heavily" (how, it is not said); he instantly felt something snap, followed by a stinging pain in his left shoulder; swelling rapidly ensued, and ecchymosis along the course of the bicipital tendon. A week after the accident active and passive extension were possible, but somewhat painful; passive flexion the same; active flexion in pronation difficult, but possible; active flexion in supination absolutely impossible; even the attempt producing intense pain at the upper bicipital region. Ecchymosis, which before was marked, almost gone. Since even most careful palpation could not prove breach of continuity of the tendon, or signs of dislocation in the shoulder-joint, the diagnosis was: laceration of the tendon, and the corresponding part of the sheath of the long head of the biceps. The arm was restored to usefulness by the use of a simple sling.

After narrating the views of the older surgeons, and mentioning Mr. Soden's case, and Malgaigne's opinion thereof (see p. 26), he continues:—

"So much is true, that no surgeon ever saw the said tendon in *statu luxationis*, and that those who made a diagnosis of dislocation concluded *a posteriori* from conditions consequent upon, or found after, a supposed dislocation."

He then directs his argument against the probability of inward or outward rotation of the arm forcing the tendon from its sheath without either disrupting or causing a luxation of the joint, but says nothing as to the possible effect of direct force. His conclusions are:—

"First, that the luxation of the long head of the biceps never was observed on the living subject in its uncomplicated form, and that its existence is very doubtful, although conventionally accepted by and reprinted in older manuals of different surgeons. Second, in cases presenting compound injuries of the joint and its osseous components, accompanied by rupture of the articular capsule, the inevitable displacement of the tendon is not of much consequence as to the whole injury, and therefore cannot be ranked as a pathological phenomenon of independent standing."

Von Pitha writes as follows (*Handbuch der Chirurgie*, Bd. 4, Abth. 2, p. 46: Luxation der Bicepssehne und Ruptur desselben):—

"Besides the previously mentioned luxation of the biceps tendon upon the tuberosity (as a complication of luxation of the humerus) an uncomplicated dislocation of this tendon has been described by Monteggia, Bromfield (*sic*), and Stanley, occurring during violent exertion, or through sudden inward rotation of the humerus. It is not apparent how in such a manner the biceps tendon is to be lifted out of its sulcus upon the great tuberosity, a dislocation in the way of which stand the insertion of the capsular ligament and of the tendon of the supra-spinatus. The diagnosis has often been made erroneously on the basis of the subjective symptoms, referred to the neighbourhood of the bicipital groove and on the associated disturbance of function. A crackling noise produced by raising the arm has been given as an important symptom. This is, however, poorly adapted to show a luxation of the tendon, as in that case the noise could only be produced by a rapid drawing back (spontaneous reposition) of the tendon from the great tuberosity with the sulcus, which would be accompanied by an instant relief to the patient; while, on the contrary, in the supposed injury the pain is increased during the production of the noise."

He then states that Jarjavay has elucidated this matter, and refers to his paper (see p. 24), adding that, moreover, no one has ever felt a luxated tendon on the great tuberosity¹ or been able to replace it. The trouble requires no manœuvres for the purpose of reposition, but disappears of itself under rest, and cold fomentation of the shoulder, with the arm in a sling.

He believes that although this "mysteriöse luxation der bicepssehne als selbständige dislocation auf das tuberc. majus," thus appears in its true light that other injuries of the tendon of the long head of the biceps are well grounded, instancing its rupture and its separation from its scapular insertion.

Volkman (*Handbuch der Chirurgie*, Bd. 2, Abd. 2, p. 874. Luxationen der muskeln und Sehnen), after detailing the symptoms described by Cowper, Bromfield, and Monteggia, says that it is well known that similar symptoms present themselves in relation to other joints, and depend upon conditions entirely different from injuries or luxations of tendons. He alludes to Jarjavay's cases, and their implicit acceptance by Von Pitha, and to the fact that Chassaignac also denies the occurrence of this luxation, adding, that it seems to him, that these authors go too far. He mentions a case recorded by Cloquet, in which a man was able at will to dislocate the biceps tendon either inwards or outwards.

"Autopsies have not thus far shown the existence of an *uncomplicated* luxation of the tendon, *i. e.*, one not associated with luxation of the shoulder. The oft-quoted case of Soden is inconclusive. In future cases of this supposed injury in the living, there will be necessary a much more precise local examination with especial reference to the function of the biceps."

The views in regard to this accident of the other writers whom I have been able to consult, may be readily summarized.

Agnew (*The Principles and Practice of Surgery*, vol. iii. p. 394), says:—

"Though I have seen a number of supposed luxations of the long tendon of the flexor biceps cubiti muscle, yet in only one case, that of a patient of Dr. J. William White, were the evidences of the displacement unequivocal."

¹ Why he insists upon it being on the great tuberosity is not apparent.

Gross (*A System of Surgery*, vol. i. p. 1161), says :—

"The nature of the lesion is always obscure, and, therefore, very apt to be overlooked, or to be mistaken for fracture, sprain, or dislocation of the shoulder. The most reliable symptoms are, inability to flex the arm from loss of power in the biceps, and pain at the seat of the injury, either alone, or in conjunction with more or less prominence of the head of the humerus."

Mr. Flower (*Holmes's System of Surgery*, vol. i. p. 841), says :—

"In the opinion of the last-named surgeon (Dr. R. Adams, of Dublin), the reported cases of dislocation of the long tendon of the biceps with partial displacement of the head of the humerus upwards, are also to be classed as the effects of disease, and not of injury; but the proof of this appears to me not quite so satisfactory as in the former cases."¹

Prof. Andrews, of Chicago (*International Encyclopædia of Surgery*, vol. iii. p. 670), dismisses the subject thus :—

"Dislocation of the long head of the biceps from the bicipital groove sometimes causes a puzzling deformity after a successful reduction, or even when there has been no luxation. Without being ruptured, this tendon is not certainly known ever to have been dislocated, although commonly so stated by old authors."

Ashhurst (*Principles and Practice of Surgery*, p. 287), says :—

"Under this head (partial dislocation) has been described an injury which appears to consist in a rupture or displacement of the long head of the biceps muscle, allowing the head of the humerus to project anteriorly." He adds in a foot-note: "This inward displacement of the biceps tendon, which Soden and others have considered traumatic, is believed by Canton to be due to the existence of chronic rheumatic arthritis, which may or may not have been the result of injury."

Hamilton (*Fractures and Dislocations*, p. 614), speaking of partial dislocation of the humerus, says :—

"It is quite probable that a majority of these accidents were examples of rupture or displacement of the tendon of the long head of the biceps muscle." "I have seen one example, in which the tendon of the biceps suddenly resumed its position after the lapse of several days, and the prominence of the head of the humerus at once disappeared." "If a displacement of the tendon necessarily causes a displacement of the head of the humerus, it might seem proper to infer that a rupture of the tendon would do the same. The only example of rupture of the tendon which has come under my observation does not confirm this view."

Sir William Fergusson (*A System of Practical Surgery*, Philadelphia, 1853, p. 201), says :—

"That this tendon is displaced in the luxations forwards or backwards (or, perhaps, to speak more correctly, that the head of the bone in such instances is displaced from the tendon), there can be little doubt; *I have seen the change more than once in the dissecting-room.*"

Nancrede (Article on Injuries and Diseases of the Bursæ, *Internat. Encyc. of Surg.*, vol. ii. p. 709), says :—

"It is quite probable that the so-called luxation of the long head of the biceps is really due to chronic bursitis of this sac,² for all the symptoms attributed to that

¹ The cases referred to are those in which, like those of J. G. Smith, Stanley, Cooper, and Fergusson, without history of injury, the tendon was found on dissection to be torn or absent. He attributes the majority of these to "chronic rheumatic arthritis," resulting in disorganization and destruction of the intra-capsular portion of the tendon.

² The sub-deltoid bursa.

lesion are present in such an inflammation with others which are irreconcilable with the existence of any displacement of the tendon."

Mr. Thomas Callaway (*A Dissertation on Dislocation and Fracture of the Clavicle and Shoulder-Joint*, London, 1849, p. 143) thinks that the accident which is usually described as a partial dislocation of the humerus forwards results from either dislocation or rupture of the long head of the biceps muscle. He describes the cases of Knox, Stanley, and Soden, and then discusses the possibility of distinguishing between a dislocation and rupture of the tendon, premising that he fears that there are but

"few distinctive signs which would materially help us in our diagnosis. Rupture of the tendon usually takes place in old persons in whom the powers of nutrition have begun to fail. It is a milder accident than dislocation. It usually takes place midway between the glenoid cavity and the anatomical neck of the humerus. The capsule of the joint is not ruptured, hence there is but little effusion, and the subsequent inflammation is not severe."

A writer in the *Real Encyclopædia*, vol. xii. p. 451, says:—

"Luxations of tendons, since the confident observations of W. Cowper and Monteggia, have been met with frequently only in the case of a few tendons. Indeed, that of the tendon of the long head of the biceps is contradicted, and has been characterized once (Jarjavay) as a supposed contusion of the sub-acromial bursa; in another case, as the result of a chronic rheumatic arthritis. (Adams.)"

Mr. Wharton Hood (*On Bone-Setting*, p. 37), says:—

"Displacement of a tendon is certainly of more frequent occurrence than is usually supposed: and, excluding several cases where the symptoms were unmistakable, I have seen numerous others operated upon in which the alteration in the appearance of the joint immediately afterwards, could only be accounted for by this explanation of the injury."

The author of the article on Tendons, in the *Nouv. Dict. de Méd. et Ch.*, vol. xxxv. p. 185, merely alludes to the subject as follows:—

"The luxation of tendons was absolutely denied by Cl. Pouteau, but its possibility was demonstrated by Monteggia, in 1803. Before him, however, William Cowper had recorded the case of a woman who had dislocated the long portion of the biceps in wringing linen."

C. Hueter says (*Grundriss der Chirurgie*, vol. ii. p. 735):—

"It may be remarked that, following the lead of Cowper, Monteggia, and others, a traumatic luxation of the long tendon of the biceps has been accepted by some. P. Vogt is very properly of the opinion that these luxations are only a portion of the injury in case of fracture of the tubercles, or of dislocations of the shoulder, and cannot well arise independently."

Mr. Frederick Treves says (*Surgical Applied Anatomy*, p. 191):—

"In certain violent wrenches of the limb the tendon may slip from its groove and be displaced to one or other side, usually to the inner side. In these cases, also, the head is drawn up under the acromion, and is prominent in front, while abduction is rendered less free than normal, owing to the great tuberosity being sooner brought in contact with the acromion."

Mr. George Murray Humphrey says (*A Treatise on the Human Skeleton*, p. 415):—

"I quite agree with the writer in the *Cyclopædia of Anatomy*, that many of the specimens in which the biceps tendon stops short in the bicipital groove, or

becomes lost in the capsule of the joint, are to be attributed, not to rupture of the tendon, but to the continued effects of chronic rheumatism originating in an accident or commencing spontaneously.'

We find thus, in studying the literature of the subject, and I believe that the foregoing represents about all of importance which relates directly to it, that the recorded evidence of the occurrence of dislocation of the tendon of the long head of the biceps muscle may be divided into two general classes: 1. The reports of clinical cases in which certain symptoms were referred by the writers to this displacement, but in which its existence was not otherwise confirmed.

2. The reports of cases in which the tendon of the biceps was found luxated at an autopsy, or during a dissection, but in many of which no clinical history was obtainable.

Mr. Soden's case seems to be the only one which belongs to both classes, and must be considered separately.

Under the first class may be placed the cases of Cowper, Monteggia, Bromfeild, Green, Callender, Mercer, and Hancock. The first three of these, as we have seen, have been assigned by Jarjavay to the category of contusions of the sub-acromial bursa, and with some show of reason. Without entering into a discussion which, on account of the meagreness of the clinical premises, would probably be fruitless, I may call attention to the fact that he does not explain satisfactorily certain symptoms which are stated positively by these writers to have existed and are entitled to as much credence as any other portion of their very careless reports. In the case of Cowper there was said to be "a depressure of the deltoid muscle," and "the two inferior tendons of the biceps"¹ were on the stretch. The difficulty was immediately removed by forcible rotation of the arm. Bromfeild describes the same method of reduction by rotation and the same result of speedy relief, while in Monteggia's case the tendon was said to return to its place and the pain to disappear, while the hand of the injured side was "upon the shoulder of another person," or in the very position which, according to Jarjavay, by making pressure on the inflamed bursa, should excite the most acute pain. The bursitis, which no doubt existed in his own cases, does not account for the depression of the deltoid, the stretching of the "lower tendons" of the biceps, or the sudden relief afforded during rotation. The true character of these cases will doubtless always remain undetermined for lack of sufficient evidence; but, whatever they may have been, it seems evident to me that they are not satisfactorily explained by Jarjavay.

Dr. Green's case can hardly be considered as conclusive, but the mode of disappearance of the trouble was certainly suggestive of a spontaneously reduced luxation of the tendon. Every other symptom can be explained on the theory of lesion of the subacromial bursa, the attachment

¹ The tendon of insertion into the radius, and the bicipital fascia.

of which over the bicipital groove to the sheath of the tendon would account for the pain felt in the shoulder on flexion of the forearm.

Mr. Callender states positively that in his case the tendon could be felt in its unnatural position, and could be replaced, but not retained in its groove. This would be evidence of a very high order if the tendon of the long head of the biceps were a structure easily recognized by palpation through the overlying tissues, but as any one can verify in his own person it is not. If Mr. Callender had stated that he recognized the bicipital groove—a distinct depression, with well-marked, prominent bony walls, having sharp edges—his assertion would have carried much greater weight.

Mercer's case I have only included out of deference to the high authority of Prof. Hamilton, who, as it seems to me, on very insufficient grounds classes it as an instance of luxation of the tendon. It was at any rate not an uncomplicated case, as the original injury was a dislocation of the shoulder, and it may therefore be dismissed without further consideration.

Hancock describes the symptoms of displacement of the tendon in much detail; but as far as I can learn does not seem, himself, ever to have seen a case.

Among those authors, who in a general way admit the existence of the luxation and describe certain symptoms as associated with it, but who do not state that they have ever met with it, may be mentioned Callaway, Gross, Ashhurst, Flower, Hood, and others, whose opinions therefore, though always worthy of respectful consideration, have not in this instance the weight which would attach to them if founded on personal observation.

The second group of cases in which the luxation was found at autopsies includes those of Gregory Smith, Knox, Stanley, Hargraves, Astley Cooper, and Fergusson, which have been so clearly shown to be in all probability examples of changes in the joint produced by rheumatoid arthritis, and not by traumatism, that no further consideration of them is necessary.

In discussing the case of Soden, which I have reserved to the last, as being by far the most important, I wish to admit to the fullest possible extent the weight of the arguments advanced by Malgaigne, Adams, and Smith in favour of the pathological causation of the displacement of the tendon. It seems to me, however, that certain important facts remain unexplained in the light of this theory. Three weeks after the accident the head of the bone was found drawn up under the acromion and unnaturally prominent in front; abduction was impossible; flexion of the forearm intensely painful, etc. Although the patient is stated to have been "of rheumatic habit," there is no mention made of any previous trouble with the shoulder, and it seems hardly probable that these marked changes occurred solely as a result of a rheumatic inflamma-

tion of the joint of three weeks' duration. They may partly have been due to a bursitis such as is described by Jarjavay, which would account for the crepitation, painful abduction, puffy swelling over the front of the joint, etc. etc., and which, it would be necessary to suppose was prevented from subsiding, as in Jarjavay's cases, in two, three, or four days, by the super-vention of the rheumatic inflammation. But even admitting the plausibility of this theory, it hardly seems to me that it is in perfect accord with the result of the autopsy. I refer here especially to the *degree* of displacement of the tendon as compared with the duration of the supposed chronic rheumatic arthritis and with the slight and certainly doubtful concomitant changes in the joint. The rheumatoid inflammation was believed to date its origin from the fall which the patient had in May, 1839. He died in November, 1839, six months later, and the tendon was found, not only displaced as to its intra-articular portion, but *out of the bicipital groove*. Now, it is evident that viewing the progress of the case in the light of the theory of Messrs. Smith and Adams, that while displacement of the upper part of the tendon over the smooth rounded head of the humerus might be expected to occur early in the disease, on the other hand, detachment of the tendon from the firm fibrous prolongation of the capsule and the synovial membrane which holds it in its groove must necessarily be a much later phenomenon. The amount of pressure required for this purpose either must

be very great when it is done suddenly, or must be distributed over a long period of time before it can produce the necessary weakening and disintegration of structure.

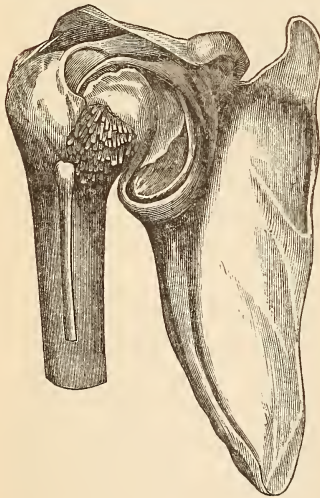
The accompanying cut, which represents the right shoulder-joint in the case of Chas. Mailly, reported by Mr. Adams, as parallel with that of Mr. Soden, illustrates the point to which I refer (Fig. 2). It will be seen that while the intra-capsular portion of the tendon is dislocated inwards, the displacement does not extend beyond the summit of the bicipital groove, in which the rest of the tendon lies.

And yet this patient had been ill for seven years or more, and bedridden for five years; and the joint was extensively

diseased. The left shoulder-joint was symmetrically affected, particularly as regarded the tendon of the biceps.

Mr. Adams himself says, in regard to the condition of the joint in Soden's case :—

Fig. 2.



"As to the anatomical examination of the joint, it will be recollected that the disease had been only six months established, and, therefore, that the more striking results of chronic rheumatic disease should be found was not to be expected. Those which were noticed, however, were such as might be supposed to represent the anatomical character of chronic rheumatic arthritis of the shoulder at an early stage."

It would appear, therefore, that, although the case cannot be considered as it originally was, as demonstrating beyond a doubt the possibility of the accident, on the other hand, it cannot be summarily dismissed as one of the many instances of *post hoc ergo propter hoc* reasoning, which have led to the mistaking of lesions due to chronic arthritis for those caused by traumatism.

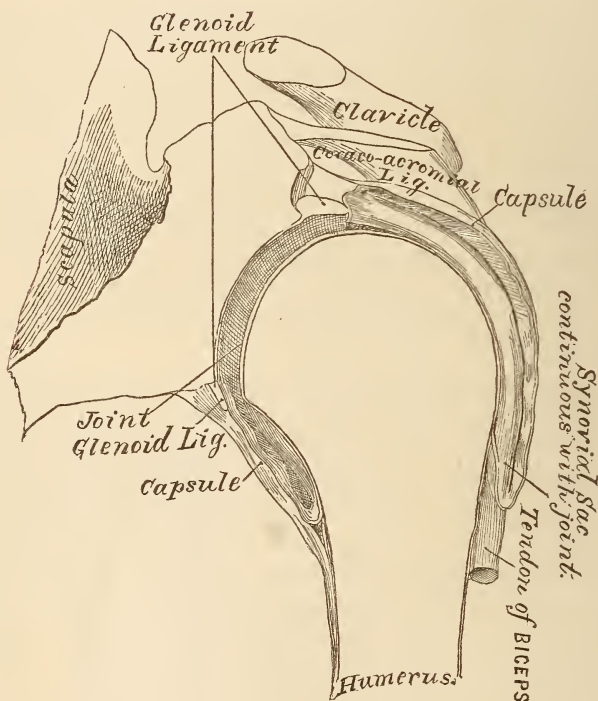
In addition to the positive opinions of Malgaigne, Adams, Smith, and Jarjavay, the no less strongly expressed views of Pouteau, Von Pitha, Volkmann, Hueter, Vogt, Gerster, and others, as well as those contained in the *Nouveau Dictionnaire*, the *Real Encyclopädie*, and the various treatises on surgery, must be given their due weight in discussing the historical aspect of the subject, which I have reviewed thus at length, in order to supply to every one the data for an independent conclusion. A careful study of the foregoing evidence has convinced me of the impropriety of basing upon it either a dogmatic assertion or denial of the existence of this lesion, the Scotch verdict of "not proven," representing the opinion at which I have arrived, and which may be more formally expressed as follows:—

Although for more than a hundred years cases of supposed luxation of the tendon of the long head of the biceps muscle have been reported or alluded to by surgical writers, yet they have been so poorly observed or so carelessly described, that they fail altogether to carry conviction, the one case which possesses any strong element of probability being itself open to reasonable doubt.

As introductory to the case which I am now about to describe, I may perhaps be pardoned for mentioning a few elementary points, in the anatomy of the shoulder-joint, which bear directly upon the subject, and which may tend to make it more readily comprehensible: The large rounded head of the humerus rests upon the shallow surface of the comparatively small glenoid cavity, which is not more than one-third the size of the former. The depth of the cavity is, however, somewhat increased by a narrow fibro-cartilaginous rim, the glenoid ligament. Overhanging this cavity is a vaulted arch formed by the coraco-acromial ligament, uniting the two processes from which it takes its name. Arising from the margin of the glenoid cavity, embracing loosely the head and anatomical neck of the humerus, and extending down to be attached below the tuberosities, is the capsular ligament, which has been described as "a sac having two apertures, of which the lower is by far the larger." This sac is so loose and capacious that it could contain a body nearly twice as large

as the head of the humerus; it gives no aid in maintaining the latter in contact with the glenoid cavity, and does not appreciably limit its movements. With its fibres are intermingled those of the tendons of insertion of the supra- and infra-spinatus and subscapularis muscles, which materially add to its strength. It is also reinforced in front and within by the tendon of the long head of the biceps which arises from the summit of the glenoid cavity, where its fibres are intimately blended with the glenoid ligament, and passes directly over the top of the head of the humerus within the capsule (Fig. 3), and then down exactly in front of the joint

Fig. 3.



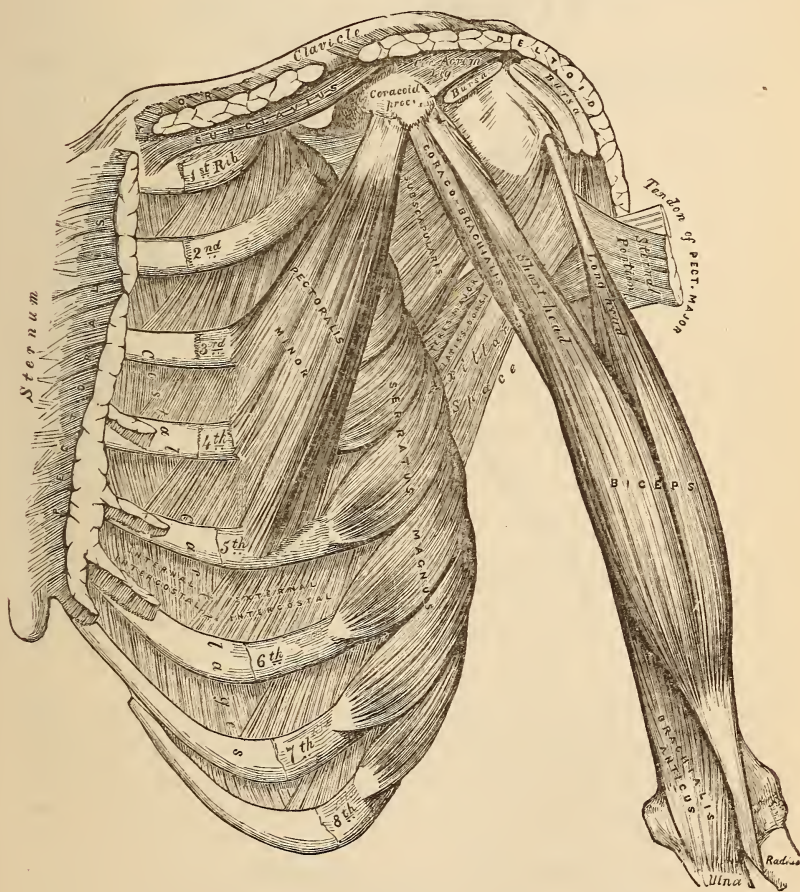
in the sulcus—the bicipital groove—between the greater and lesser tuberosities. A prolongation of the capsular ligament, and within that another of the synovial membrane, cover the tendon at this point, and convert the groove into a canal. This is strengthened externally by the insertion of the tendon of the pectoralis major into its outer lip.

The bicipital tendon, however, at least when the forearm is fixed, would manifestly have a tendency to draw downwards the head of the humerus, and certainly cannot be considered as holding it in its articular cavity. This is effected chiefly by atmospheric pressure, aided greatly, however, by

the action of the deltoid, the clavicular fibres of the great pectoral, and the supra-spinatus, all of which muscles act to great mechanical advantage as direct elevators. The arm is turned outward by the action of the muscles inserted into the greater tuberosity, the supra- and infra-spinatus and teres minor; it is rotated inwards by the subscapularis assisted by the sternal fibres of the pectoralis major; it is abducted, or drawn directly out from the side by the deltoid, assisted by the supra-spinatus. It is then lowered by the latissimus dorsi and teres major muscles.

Between the outer and anterior portion of the capsular ligament and the under surface of the deltoid muscle is situated a large bursa (Fig. 4),

Fig. 4.

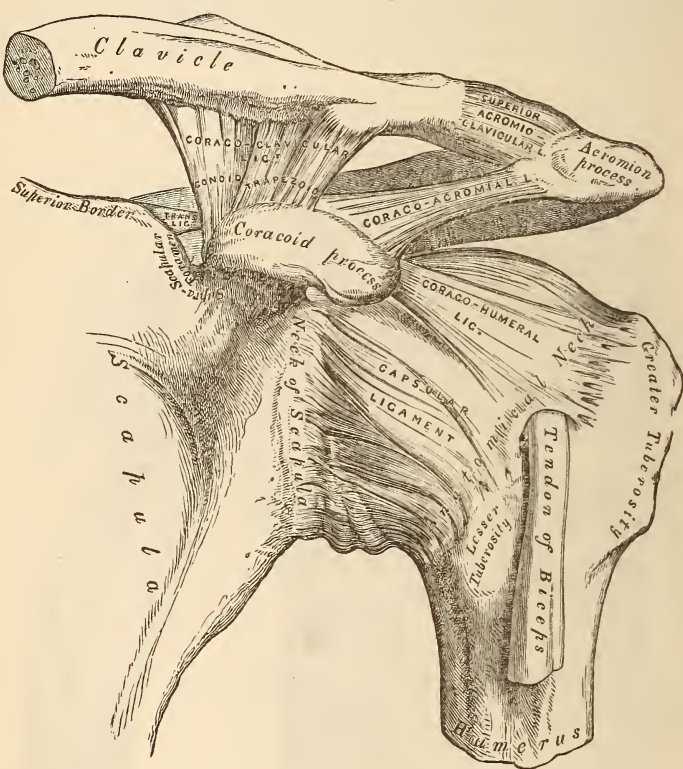


which, by reducing friction, facilitates the movements of abduction and rotation. The lower wall of this bursa is attached by some strong connective tissue fibres to the underlying parts; including the fibrous sheath

of the bicipital tendon. Its upper wall is attached to the under surface of the deltoid muscle. Another bursa lies beneath the subscapularis muscle, and almost invariably communicates with the general synovial cavity of the joint.

Between the lower surface of the acromion and the upper surface of the head of the humerus there exists normally a considerable interval (Fig. 5),

Fig. 5.



which is occupied when the arm hangs by the side by the upper portion of the capsular ligament, and by some fibrous tissue;¹ when the arm is brought into the horizontal position this space is diminished, and the sub-deltoid bursa glides into it, or, in other words, becomes sub-acromial, by which name it is often described.

CASE. In September, 1881, I saw, in consultation with Dr. Thos. K. Reed, of Atlantic City, New Jersey, the following case:—

¹ A case of paralysis of the deltoid is recorded by Nannoni, in which four fingers could be lodged between the humeral head and the acromial vault. Paulet, *Traite d'Anatomie Topographique*, p. 677

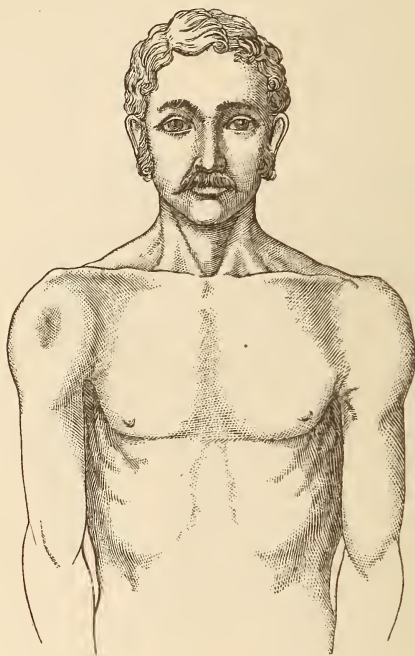
T. W., a carpenter, aged 37, previously healthy in every respect, while ascending a ladder, with his arms full of tools, lost his balance, and fell backward from a height of six or eight feet. While falling he made an effort to save himself, and so far succeeded as to effect a semi-rotation of the head and trunk, which brought the right anterior surface of the body into the most dependent position. His fall was arrested by a porch about fifteen inches in height, upon which the front of his right shoulder struck, his right ear just grazing the edge of it, but his head escaping all other injury. There was immediately acute pain and swelling over the right shoulder, with helplessness of the arm on that side. He was seen in a few minutes by Dr. Reed, and then presented the following phenomena: He was sitting, holding the hand of the injured side in the left hand, palm upward, and turning its ulnar border strongly in the same direction, or, in other words, was holding it in a position of external rotation, or forced supination. The forearm was flexed on the arm at an obtuse angle, and the elbow was held close to the side of the trunk. On releasing the hand and allowing the arm to hang by the side there was instant and irresistible rotation of the humerus inward, which occurred to such an extent as to turn the palmar surface of the forearm and the palm of the hand backward, and even slightly outward. Any attempt to remove the elbow from contact with the side was followed by a seeming displacement of the head of the humerus, which slipped forward and inward, increasing the projection on the front of the joint, although at no time could the head of the bone be felt in the axilla, and it was always possible to place the hand of the injured side on the sound shoulder, keeping the elbow in contact with the front of the chest. There was great swelling of the shoulder, most marked over its anterior and outer aspects. This swelling was soft, almost fluctuating, and not ecchymotic. On the front of the joint, about one and a half to two inches below the level of the acromion, was an oval depression, about an inch in length, and a half inch in depth, its long axis parallel with that of the humerus. A finger inserted into this depression seemed to come almost directly in contact with the bone, nothing but skin and subcutaneous tissue appearing to intervene; and these seemed to be bound down tightly at this particular point. The patient described the condition as the skin having "grown fast" to the bone. There was sharp lancinating pain in the shoulder on the slightest movement of the arm, which was preternaturally mobile. On removing the elbow from the side a creak or "squeak" could be plainly heard by the bystanders, resembling, but moister than, the sound of true crepitus. There was a slight but undoubted depression beneath the acromion externally. An axillary pad and a handkerchief so applied as to carry the elbow inward gave great relief to the patient, although he still suffered considerable pain, which persisted in varying, but gradually decreasing, intensity for some weeks.

At the time of my visit, about two weeks after the accident, the above symptoms were noted, and, in addition, the following: The vertical circumference of the shoulder, although there was still some swelling, was half an inch to one inch less than that of the sound side (Fig. 6). A line of ecchymosis, beginning about on the level of the axillary border, extended down the arm, following closely the line of the biceps. This had made its appearance three or four days after the injury. It persisted for some weeks, gradually finding its way down the radial side of the forearm almost to the wrist.

When the forearm was extended upon the arm, a painful degree of

tension was produced along the line of the biceps, the border of which muscle became plainly evident beneath the skin; this pain extended to the point of insertion in the radius and was described by the patient as even running down to the wrist. Flexion of the forearm was possible with difficulty, the movement being tremulous and void of force;

Fig. 6.

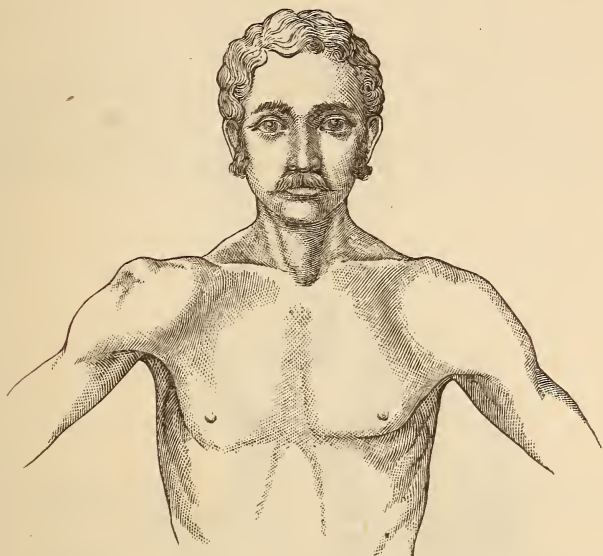


it was associated with a sharp pain over the head of the humerus. Flexion of the supinated forearm was much more painful than flexion during pronation. In the former case the sensation described by the patient was one of "dragging" over the head of the humerus. The oblong or oval depression over the head of the bone (Fig. 6) had, with the subsidence of the swelling, become more rounded in appearance, but was still very distinctly marked. At this point, and for a little distance above and below it, a longitudinal furrow could be plainly felt in the bone which seemed to correspond accurately with the situation of the bicipital groove. This furrow was empty. To its inner side could be felt indistinctly a round movable body, rolling slightly beneath the fingers, and thought at the time to be the bicipital tendon. Neither this nor the groove could be felt on the sound shoulder. All attempts at replacement were futile.

On elevating the arm, it was seen that the scapula moved largely with the humerus, the acromion became prominent on the summit of the shoulder (Fig. 7), and the axilla of the injured side as compared with that of the sound side was greatly lengthened (Fig. 8). The angle of the scapula on the injured side, when the arm was raised above the head, was carried out quite to or a little beyond the side of the chest.

The slight depression immediately below the tip of the acromion still existed, with considerable fulness over the upper, front, and inner aspects

Fig. 7.



of the joint, apparently due to an abnormal projection of the head of the humerus in that region. There was slight shortening on measurement from

Fig. 8.



the acromion to the external condyle, but not more than half an inch, possibly a little less. The tendency to spontaneous rotation of the arm was

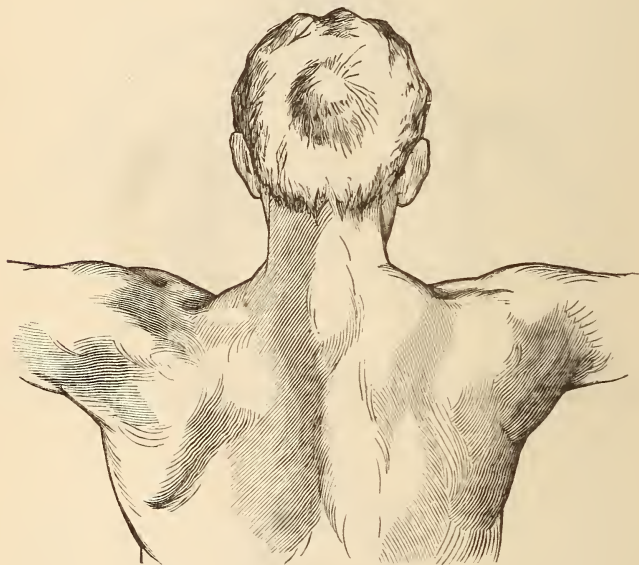
still felt, but was much less noticeable. The arm was very mobile, and the head of the bone could be rotated freely in every direction. There was no history of rheumatism in the patient himself or in his family.

In October, 1883, the patient was again seen and examined. He had regained almost entire use of his arm, although the disability had been almost complete for a year and quite marked for eighteen months.

- Flexion of the forearm on the arm was complete and painless.

Elevation of the arm above the head was still accompanied by undue movement of the right scapula, the acromion becoming unnaturally prominent and the angle going somewhat nearer the side of the chest than on the left side (see Fig. 9). The bicipital groove could still be felt, and possibly

Fig. 9.



the tendon to its inner side. On raising the arms equally the depression which normally appears at the tip of the acromion was apparent on the left or sound side, but could not be seen on the right (see Fig. 9). With the arms pendent there was a noticeable difference between the shoulders, the deltoid on the right side being shorter and its curve rounder and fuller, while at the same time the acromion projected more than normal (see Fig. 10).

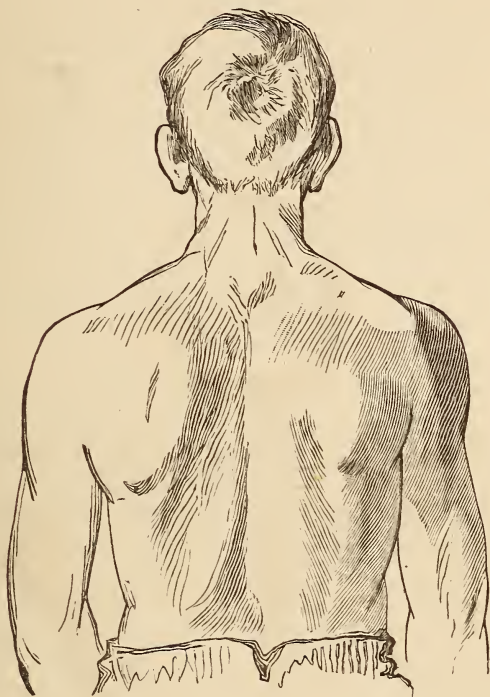
It will be seen, I think, on carefully analyzing these symptoms, that taken together they lead almost irresistibly to the conviction that, in this case at least, there had been true traumatic luxation of the bicipital tendon, and that each one of them is susceptible of rational explanation on this theory.

They may be enumerated as follows :—

1. *The recognition of the bicipital groove, empty.* This, which was the symptom on which the original diagnosis was founded, is perhaps the

most important of the group, as, if its existence be admitted, it is absolutely pathognomonic. In very thin persons the groove may be felt through the anterior fibres of the deltoid which overlies it; in muscular persons not

Fig. 10



so readily. Empty of its tendon its sharp edges, its deep sulcus, its situation precisely in front and a little to the inner side of the head of the bone, its movement with the latter, might be expected on *à priori* grounds to render it much more easily recognizable than in its normal condition.

It certainly seemed to me, when I first saw the patient, that it could be readily and unmistakably felt, but I am glad in this respect, as well as in others, to have the corroborative opinion of so distinguished a surgical anatomist as Professor Agnew, to whom the case was submitted for criticism, and who was equally convinced of the facts above stated.

2. *Recognition of the tendon itself.* Of this I was by no means positive. It seemed that the tendon could with difficulty be felt a slight distance to the inside of the joint, but it was so uncertain that I do not attach any weight to this symptom, which was of but doubtful value.

3. *Inward rotation of the arm.* This was very peculiar, and could only be simulated, as far as I know, by that which is said to occur after frac-

ture of the great tuberosity in which the external rotators, the supra- and infra-spinatus and teres minor being rendered powerless the arm is turned inwards by the subscapularis assisted by the sternal fibres of the pectoralis major. Something analogous to this took place, I believe, in this case. Although, as I have said, there was no conclusive evidence as to the position of the tendon, there are good reasons for supposing that in any case in which it was displaced by direct violence it would probably go inwards. The tendon of the great pectoral arching above the groove and inserted into its outer edge (Fig. 4), and at a higher level the tendon of the supra-spinatus inserted into the great tuberosity would probably prevent it in the majority of cases from passing outwards.¹ If then it went in the opposite direction it would lie directly on the tendon of the subscapularis, which would thus be stimulated to spasmodic action, and would tend strongly to rotate the bone inwards,² acting in the new position of the bone, as will presently be seen, to much greater advantage than its antagonists. Then too the tendon itself, in its new position, would strongly aid in the movement of internal rotation.³

4. *A slight depression under the tip of the acromion; a prominence of the shoulder in front; and a flattening behind.* It will be observed that in cases of rheumatoid arthritis in which the bicipital tendon is atrophied or displaced, the head of the bone is invariably found to be elevated and to lie just beneath the acromion. Mr. Soden gives excellent reasons for supposing that the course of the tendon permits it to act in the place of a capsular muscle running from the ribs to the humerus, and opposing the upper capsular muscles. This opinion as to the function of the intra-capsular portion of the tendon appears to be that of the large majority of surgeons. I have found none who dispute it.⁴ If now, this tendon is displaced by violence, there can be no reason why, just as when it is dislo-

¹ "In its course between the tubercles it plays upon the inner rather than the outer one." Humphry, op. cit., p. 414.

² Duchenne (*Physiologie des Mouvements*, p. 84) describes the subscapularis as the great anterior—or internal—rotator of the humerus.

³ See Humphry, op. cit., p. 414. "By its pressure upon the inner tubercle the tendon prevents undue rotation of the head of the humerus outward," *et seq.*

⁴ "It strengthens the upper part of the articular cavity, and prevents the head of the humerus from being pressed up against the acromion process when the deltoid contracts." Gray, p. 310. "The biceps tendon strengthens the upper part of the joint . . . and prevents the head of the bone from being pulled too closely upwards under the acromion." Treves, op. cit., p. 191. "Several purposes are served by the peculiar course and disposition of this tendon. It strengthens the capsule at the upper part, and assists to prevent the head of the humerus being pressed against the acromion by the contraction of the deltoid and other muscles." Humphry on the Skeleton, p. 414. "The biceps tendon tends to prevent the head of the humerus being pulled too closely upward against the under surface of the acromion." Henry Morris, *Anatomy of the Joints*, p. 218. "Its evident function is to apply the humeral head to the glenoid cavity and to prevent its displacement in shocks directed from below upward." Paulet, op. cit., p. 678.

cated from disease, the powerful deltoid, aided by the supra-spinatus¹ and the clavicular fibres of the pectoralis major, should not draw it up into close proximity to the acromion, and this seems to be what occurred in the present case, the bone at the same time being drawn inward by the sternal fibres of the pectoralis major, and by the latissimus dorsi and teres major, all of which are placed somewhat on the stretch by this elevation of the humerus. This drawing inwards permits, in spite of the elevation of the head of the humerus, of the little depression beneath the tip of the acromion. While on the one hand, also, the origin and insertion of the supra-spinatus, an active external rotator, are approximated, the origin and insertion of the subscapularis are removed from each other, favouring strongly the internal rotation above described.

5. *Diminution in the vertical circumference of the shoulder.* That this existed even during the period of swelling was very significant. It is just the reverse of the sign of dislocation, originally pointed out by Mr. Callaway, and was evidently due to the elevation of the head of the humerus.

6. *Shortening of the arm as measured from the tip of the acromion to the external condyle.* This should, of course, in the absence of symptoms of fracture, be referred to the same cause.

7. *Elevation of shoulder, tilting up of acromion, and elongation and narrowing of axilla when the arm was carried upwards.* This was also due to the elevation of the humerus. The muscles which constitute the axillary borders, the great pectoral and latissimus, already on the stretch, as has been said, were made more so by the abduction of the arm, became tense and elongated, and gave rise to the peculiar appearance of the axilla which contrasted strongly with the easy natural curves of that on the sound side. (Fig. 8.)

The tilting up of the acromion was due to the presence of the head of the humerus just beneath its tip, the two bones impinging on the injured side when they formed a large obtuse angle, while on the other side they hardly touched until the arm was lifted a little above the head, or had at least attained a horizontal position.

This symptom (as will be seen by reference to Figs. 9 and 10) persisted, though to a less degree, two years after the accident. To the same cause—elevation of the humerus—are due the shortened deltoid, the unnaturally rounded outline of the shoulder, the lessened vertical circumference, the absence during elevation of the arm of the normal dimple found at the tip of the acromion superiorly, and the slight tilting of the scapula, all of which appearances are admirably shown in the same cuts.

8. *The peculiar depression situated over the bicipital groove.* Unless the “depressure in the deltoid muscle” described by Cowper, referred to a

¹ Duchenne (op. cit., p. 75) says that this elevating action of the supra-spinatus is much more energetic and important than is generally supposed.

similar appearance, I can find no mention of any such exact phenomenon in surgical writings, either in connection with this or any other injury of the shoulder-joint. I believe it to have been probably caused in one of the following ways, the last of which I am inclined to favour, though it does not appear that anatomical considerations alone enable us exactly to determine the point:—

1. The tendon in its displacement from the groove may have dragged with it a portion of the inner edge of the subdeltoid bursa attached to its sheath, and through its medium, put on the stretch and tied down some of the fibres of the deltoid muscle itself. The injury being followed, just as in a bad sprain, by rapid and extensive synovial effusion, involving not only the bursæ but the general cavity of the joint, this swelling manifested itself wherever the capsule and the bursæ permitted of distension. Over the region of the groove, however, they were drawn so tightly and were so tense by reason of their connection with the sheath of the tendon that swelling could not occur. (The succeeding symptom, No. 9, will explain my reason for thinking that this sheath was put greatly on the stretch, but not lacerated.) The drawing of the muscular fibre with them would account for the ease with which at the bottom of this dimple the bicipital groove could be felt, covered apparently with little else than skin. The chief objection to this view lies in the fact that the subdeltoid connective tissue, though exceptionally very dense and firm, is, as a rule, loose and yielding, and would probably stretch considerably without materially displacing the muscle itself. 2. There may have been rupture with retraction of some of the fibres of the deltoid muscle directly over the seat of injury. 3. The bursal and synovial swelling pushed before it, and slightly separated the adjacent edges of the deltoid and pectoralis major muscles, leaving the interspace over the line of the groove, without superjacent muscular tissue. The larger size of the bursa *external* to the groove,¹ and the greater freedom from tension of the capsule and synovial membrane at that point—the tendon having been presumably displaced inward—would account for a greater proportionate displacement outward of the anterior edge of the deltoid, giving the depression the appearance of being somewhat external to the normal situation of the groove between that muscle and the pectoralis major.

Examination of the dissected shoulder shows that a line drawn from a little within the tip of the acromion directly down over the front of the joint, will at a point below the head of the bone intersect the bicipital groove and the intermuscular fissure in question, or will at the furthest be a few lines outside of that fissure. Now it must be remembered that in this case the deltoid was markedly shortened, and its anterior edge consequently displaced upward, so that the peculiar depression and the part of

¹ See Morris, *op. cit.*, p. 221.

the interspace overlying the bicipital groove were in the same general locality.

It is well known that the synovial swelling which sometimes makes its appearance in the groove between the pectoralis major and the deltoid muscles during the course of a synovitis may be distinctly bilobed from pressure of the unyielding biceps tendon, then *in situ*, and this resembles more closely the symptom under consideration than any other development associated with disease or injury of this joint.¹

While, therefore, I do not deny the possibility of the depression having been caused in one of the two preceding ways, I think on anatomical grounds that the latter explanation is the most probable, though I do not pretend to consider it as indubitable.

9. *The line of ecchymosis following and strictly limited to the course of the biceps muscle.* This was most marked and characteristic, appearing only some days after the injury, and slowly gravitating down the arm in the line of the sheath of the muscle. It might occur, of course, in a fracture between the tuberosities extending into the bicipital groove, or it might follow a rupture of the tendon. If the sheath of the tendon were torn the ecchymosis would possibly be less strictly limited to the area of the muscle.

10. *A creak or "squeak," heard distinctly on carrying the elbow away from the side.* This was thought at the time to be due to the play of the tendon in its new position, but it is more probable that it was caused by the accompanying bursitis. To elicit it it was not necessary to take the arm more than a few inches from the side of the chest, but then it must be remembered that the head of the bone was already high up beneath the acromion, and that the bursa was largely distended, so that compression of the latter between the humerus and the acromion would begin very early in the movement of abduction. This noise was not heard on *flexion* of the elbow, another fact which renders it probable that its origin was bursal and not tendineal. It was not to be confounded with true crepitus, which could at no time be elicited.

11. *Flexion of the forearm on the arm was painful, the pain being sharp, lancinating, and felt at the front of the shoulder; flexion during supination was much more painful than flexion during pronation.* The existence of pain during flexion of the forearm can readily be understood. The reason for the difference between pronation and supination may best be explained by the following article by C. Hueter,² which I trans-

¹ Lorsqu'une collection liquide s'amasse dans la synoviale, le gonflement qui en résulte arrondit le moignon de l'épaule et en fait disparaître les saillies extérieures; mais le tendon du biceps se trouvant de plus en plus distendu, coupe, pour ainsi dire, la tumeur en deux, de sorte que celle-ci semble être bilobée. Il est clair que si la collection liquide est située en dehors de l'articulation, on n'y observera rien de semblable." Paulet, op. cit., p. 678.

² Zur Diagnose der Verletzungen des M. Biceps Brachii. Archiv für Klinische Chirurgie, 1864, Bd. 5, s. 321.

cribe somewhat fully on account of the important bearing of the symptom to which it relates.

A student suddenly felt, while fencing, a severe pain in the upper third of the forearm exactly corresponding to the long head of the biceps; thenceforth he had on account of this severe pain, which manifested itself at every attempt at motion, lost the ability to bend the forearm actively while it was supinated. But on the contrary, when the forearm was in pronation, active flexion was easy and painless. This particular symptom in an injury which certainly must have been associated with a lesion in the course of the long head of the biceps or with a rupture of the muscular fibres, or with an injury of the sheath of the tendon, was to me especially striking, because theoretically I had believed, on the contrary, that we should expect a marked pain on flexing the pronated forearm. It is well known that when the forearm is pronated, the points of origin and insertion of the biceps are further apart than in supination, its muscular fibres being also stretched to a greater degree.¹ A contraction of these must on that account, in this position, so much the more draw apart from each other the already separated fibres or much more strongly drag the tendon against the wounded sheath.

Nevertheless, the elucidation of the symptoms becomes very easy if we sufficiently consider the physiological action of the biceps. In the pronated forearm, the radius crosses the course of the ulna in such a manner that it can be supported in the movement of flexion of the latter; the moving forces which have their *points d'appui* in the ulna can, by the motion of the pronated forearm under these favourable circumstances, move the radius in the direction of flexion with very slight exertion. In supination both bones lie next to each other, and on that account the mechanical relations become so unfavourable for their common flexion that the contraction of the brachialis internus² is no longer sufficient for the completion of this motion. At least one feels on flexion of the supinated forearm, even although there is nothing to overcome but gravity, that the biceps swells. But in the pronated forearm, flexion is not only possible through the unaided action of the brachialis internus, but this flexion is well known to be, as a rule, exclusively completed through this muscle. If one then, with moderate force, completely flexes the pronated forearm, it may easily be felt that the belly of the biceps muscle remains soft and flabby. In a similar complete flexion of the supinated forearm, there may be plainly felt, on the contrary, a contraction of the biceps, and by measuring the circumference of the arm at its middle, there is found in the latter instance an increased circumference of several lines. In very energetic movements the biceps muscle also contracts in flexion of the pronated forearm, but there always remains noticeable, in a similarly strong complete flexion of the supinated forearm, a striking difference in the tension of the muscle. Clearly a contraction of

¹ Gerster translates this: "The tendon of the biceps is stretched to its full length in supination; in pronation it is wound around the radius." (Op. cit., p. 498.) "The sentence in the original is as follows: Bekanntlich sind bei pronirtem Vorderarm die Insertionspunkte des M biceps weiter von einander entfernt, als bei Supination, seine Muskelfasern, also in höherem Grade gespannt; eine Contraction derselben muss deshalb in dieser Stellung die getrennten Fasern um so mehr auseinander-zerren, oder die Sehne gegen die verletzte Scheide um so kräftiger andrängen."

² Brachialis anticus.

the biceps in the pronated forearm must always next occasion a movement of supination; *i. e.*, the tendon rolled around the neck of the radius must be unrolled before its flexing action can take place, and therefore we are accustomed in movements of moderate force not to set that muscle in action. In powerful movements, however, its contraction is not superfluous; its supinating action must then become equalized through the contraction of the pronators. In supination the action of the biceps is indispensable, both on account of the above-mentioned unfavourable position of the two bones of the forearm and also because the muscles which can largely aid in flexion of the forearm, especially the pronator teres and the flexor carpi radialis, have at the same time a pronating action, and therefore cannot contract.

The above described symptom, which led me to a consideration of the facts detailed, makes it clear that in flexion of the pronated forearm, the biceps muscle is not usually brought into action, and on that account a separation of its injured fibres does not occur during this movement. We have also in this symptom a means of diagnosing injuries of the biceps in doubtful cases.

12. *When extension of the forearm was attempted, a tense line along the edge of the biceps could be both felt and seen.* The cause of this is obvious.¹

13. *The pain felt over the joint was also felt along the line of the biceps as far as its insertion, and the patient still has a "drawing" sensation over that region.* The explanation of this is to be found in the fact that Mr. Hilton long ago called attention to:—

"That the same trunks of nerves, the branches of which supply the groups of muscles moving any joint, furnish also a distribution of nerves to the skin over the same muscles and their insertions, and that the interior of the joint receives its nerves from the same source."²

14. *The arm was preternaturally mobile for some time after the accident.* The support of the tendon being withdrawn, this was to be expected.³ It is important, however, to note that at *no* time was there any approach to ankylosis, which might have been suspected from the tilting of the

¹ The stretching of the "two inferior tendons" of the biceps, described by Cowper and Mangetus, will be remembered. This expression, which does not occur in modern anatomical or surgical writings, is explained by the following passage from the *Theatrum Anatomicum* of Mangetus (Geneva, 1717, p. 39), and clearly refers to the bicipital fascia and to the radial tendon of insertion: "Accuratissimus Anatomicus, Guilelmus (sic) Cowper super Musculo Bicipite, seu potius ejus tendine, hæc observat. Tendo hic duplex est, ejusque pars exterior, quæ tenuis est, transit oblique super Musculum Pronatorem Radii Teretem & instar membranæ se se expandens, jungitur Membrance Musculorum Communi, quæ omnes externos Carpi ac Digitorum Musculos complectitur. Altera vero robustior multo ac rotunda in superiori Radii capite inseritur. Duplex autem, addit, tendinosa hujus musculi terminatio (quamvis à nullò autore, quod sciam, observato fuerit) est admodum evidens, & à nobis primùm conspicua ante aliquot annos," etc. For the original, see Cowper, *op. cit.*, pp. 74, 75.

² "By its passage along the bicipital groove it assists to render the head of the humerus steady in the various movements of the arm and forearm." Humphry, *op. cit.*, p. 413. See also Cloquet, *Anatomie Descriptive*, p. 199.

shoulder and the appearance of the axilla. The head of the bone was always freely movable with no trace of adhesion.

15. *The position of the patient after the accident.* This was markedly different from that seen after fracture of the clavicle, dislocation of the humerus, etc. No attempt was made to support the humerus, as in those cases, by the hand placed under the elbow. The effort was obviously directed to overcome: (1) the internal rotation of the humerus; and (2) the drawing inwards of the head of the bone; and for these objects the hand was held strongly with its ulnar border upward, and the elbow was brought in front of the chest.

16. *The character of the force producing the difficulty.* This was peculiar in the fact that the *front* part of the shoulder struck first, the height of the piazza protecting the head from injury. It was, as will be evident on careful thought, just such a blow as might be expected to produce the injury in question, the force coming evidently from above and outside, and striking just in the region of the tendon; the biceps at the time was probably relaxed, though this is a matter of conjecture.

These symptoms, as I have said, seem to me collectively to constitute very strong evidence in favour of the existence in this case of a luxation of the tendon, but a few words may be added in regard to diagnosis.

From *chronic rheumatic arthritis*, the entire absence of rheumatic history, the cause and the progress of the case sufficiently separate it, all the diagnostic symptoms coming on in a healthy joint within a few moments of the accident. Those which remained after the subsidence of the swelling and traumatic inflammation were evidently due to the new position of the head of the bone and not to any arthritic process.

From uncomplicated *subdeltoid bursitis*, it might be diagnosed by the elevation of the head of the bone, the accompanying changes in the shape and size of the shoulder, and all the symptoms referable to the biceps muscle itself; *i. e.*, the ecchymotic line, the difference in flexion between pronation and supination, etc. The much greater severity of the accident also constitutes a marked point of distinction. It will be noticed that two of Jarjavay's patients were nearly or quite well in three days, one in nine days, one in three weeks, and the other in six weeks, in the latter instance in spite of very meddlesome treatment.

These symptoms also differentiate it from *fractures* near the joint, the only one of which that at all resembles it being *fracture of the greater tuberosity*. In a supposed case of this injury, Gurlt¹ noted the symptoms as extreme passive mobility at the shoulder, complete loss of voluntary outward rotation, and partial loss of voluntary elevation of the arm; crepitation could be elicited by vigorous rotation. There is to this extent a superficial resemblance between the cases, but it goes no further, all the

¹ Quoted by Stimson—*Treatise on Fractures*—p. 363.

other symptoms noted in my case being absent or at least undescribed. In the cases of Mayo (quoted by Bransby Cooper) there was flattening of the deltoid, and abduction, instead of increasing the deformity, which resembled a luxation, caused its disappearance. In the cases of R. W. Smith¹ there was probably a concomitant luxation; the transverse diameter of the shoulder was apparently much increased.

In Stimson's case,² voluntary abduction was possible; there was demonstrable separation between the two tuberosities, the lesser one moving with the shaft of the humerus; there was crepitus, and the shoulder presented no deformity, except general swelling. In my case the entire head of the humerus could always be felt to move with the shaft, there was no crepitus, the transverse diameter of the shoulder, if changed at all, was lessened, certainly not increased; the groove felt in front of the head of the bone was perfectly fixed. If it had been a line of fracture or separation between the two tuberosities, the outer lip should have been more or less mobile. The symptoms directly referable to the biceps muscle complete the diagnosis.

From *dislocation of the humerus* it could readily be distinguished by the preternatural mobility, the presence of the head of the bone in or above the glenoid cavity, the ability to place the hand on the opposite shoulder, the diminished circumference of the injured shoulder, etc.

In all of these cases there are to be mentioned, in addition, the *peculiar* symptoms of the case, the recognition of the groove, the depression in front of the shoulder, the line of ecchymosis, the early movement of the scapula during abduction, the inward rotation of the arm, the difference between flexion in pronation and that in supination, etc. etc.

The condition with which it is most likely to be confounded is *rupture of the biceps tendon*, apparently a more frequent accident.

As might be expected, several of the symptoms coincide. The painful flexion, the difference between pronation and supination, the sharp pain at the shoulder-joint, the approximation between the head of the humerus and the acromion,³ etc. etc., are all present. There is, in addition, however, in the large majority of the reported cases of rupture, a larger ecchymotic swelling coming on almost immediately; no mention has been made of the peculiar depression; or of the internal rotation of the arm; or of the line of tension along the edge of the biceps; the accident has invariably been caused by violent muscular action, not by direct force; and there is also in most of the cases of rupture⁴ a history of the sudden appearance on the front of the arm of a more or less firm tumour, consisting of the con-

¹ Fractures in the Vicinity of Joints, p. 176.

² Op. cit., p. 364. See also, Hamilton, p. 240; Agnew, vol. i. p. 881.

³ Hancock, op. cit., p. 509.

⁴ Gerster, op. cit., p. 496; Hamilton, op. cit., p. 616; Hancock, op. cit., p. 539; Stokes, Lancet, 1842-3, vol. ii. pp. 621, Humphry, op. cit., p. 415, etc. etc.

tracted belly of the muscle. In other cases, the whole muscle is flabby and relaxed. As I have said, these cases are comparatively numerous; they may as a class be illustrated by the accompanying cut (Fig. 11),

Fig. 11.



taken from a case reported by Dr. Hopkins (*Med. Times*, March 24. 1883). in which, during violent muscular exertion in a man 55 years of age, who had had for several months a chronic rheumatic trouble of the shoulder, something was suddenly felt to snap, and there was pain with partial loss of power in the arm. He was disabled for but a short time. The deformity, five weeks later, is figured in the cut, and was thus described: "The mass of muscle stood out prominently. Its upper border, irregular in outline and somewhat nodular, terminated abruptly in the depression which exists just below the inferior margin of the deltoid. The hard nodulated condition at this point was evidently caused by the contraction of unresisted muscular fibres on themselves, and on their tendinous coverings. The position of the muscle was changed, being below the middle of the arm rather than slightly above, as in health. The tendon of the short head could be clearly traced almost up to its origin at the coracoid process of the scapula, while that of the long head could not be felt to react at all beneath the fingers during forcible flexion and extension of the forearm, as it ordinarily can be."

It is possible that the case which I have thus related may be susceptible of some other interpretation; it is not one about which it would be judicious to dogmatize; surgical experience is amply convincing of the inevitable uncertainty which hangs about changes occurring beneath the skin, and especially in the neighbourhood of joints; surgical literature shows, and very aptly in this particular instance, that phenomena which at one time or to one mind seem susceptible of but one interpretation, at another

period or to other observers assume a widely different aspect. Yet the symptoms in this case, taken as a group, and viewed from the theory that an uncomplicated luxation of the tendon of the long head of the biceps took place, certainly seem sufficiently consistent with one another and with the facts of anatomy and physiology, to justify me in placing them in this shape before the profession.

222 S. 16TH ST., PHILADELPHIA.

ARTICLE II.

MULTIPLE CUTANEOUS ULCERATION. By I. EDMONDSON ATKINSON, M.D.,
Professor of Pathology and Clinical Professor of Dermatology, University of Maryland.¹

IN June, 1881, I was enabled, through the kindness of my friend, Dr. F. E. Chatard, Jr., to see a case of such unusual interest, that with his permission I made extended notes of its history and course. These I append in detail, partly on account of the almost unique character of the case, and partly because from them it will become evident that we had to do with a pathological process belonging to that most important, but as yet vaguely understood class, the "tropho-neuroses," and closely related to the rare and remarkable affection first described, in 1862, by Raynaud, as symmetrical gangrene.

CASE—June 11, 1881. Nina R., 28 months old, is the child of parents of mixed negro and white descent. She is the only issue of her mother by a second marriage, which dates back three years. Her mother has three other living children by her first husband. The youngest of these is now 18 years old. One child died 20 years ago of whooping-cough. During the first marriage there were two miscarriages many years ago; but there have been none since the present marriage. There is not the smallest evidence of syphilis in the parents, who are well-to-do people. Nina was born at full term and apparently quite healthy. She continued well until she was two years old, but was rather backward in teething, having only twelve teeth at that age.

On the day she was two years old she had sore mouth and throat, and was visited by a physician. The buccal cavity and throat soon got well, but the lips remained cracked and swollen, and bled freely when stretched, as in laughing and crying. At the end of a week another physician saw her, and speedily relieved these symptoms. She did not get perfectly well, however, and her attendant said she had a "slow intermittent," for which he visited her for three weeks or more, ceasing to call as she improved. He was soon called in again on account of what the mother describes as a "swelling of the stomach," which was relieved in eight or ten days. Soon after this, about eight or nine weeks ago, she seemed to be

¹ Read at the seventh annual meeting of the American Dermatological Association, held at Lake George, August 29, 1883.

attacked with itching all over the body. Her feet and hands swelled, and became dry and wrinkled. Upon the dorsal surfaces of the toes pimples appeared. Small vesicles soon succeeded these. Vesicles with whitish, watery contents appeared also upon the dorsal surfaces of the fingers. These ruptured and left deep ulcers with copious discharge. The hands, feet, toes, and fingers were thus attacked, and the ulcers that formed, originally of small superficial dimensions, but deep and covered with thick yellow pus, enlarged both in depth and surface, and became irregular in outline. Eight weeks ago diarrhœa set in, and has proved very intractable.

The child now began to waste and become fretful and feeble. Her mouth again became sore, and ulcers of small size appeared upon the mucous membrane of the cheeks, tongue, and gums, and the throat became swollen. The saliva, which flowed freely, seemed to irritate the skin of the lip. At this point a small ulcer appeared, which rapidly extended widely but superficially. This is now of irregular outline, and extends from the left side of the lower lip stretching toward the right and involving a surface that reaches half-way to the ear and nearly to the level of the eye. It is not, and has never been, deeply excavated, nor has it discharged freely until the last few days. During this time it was difficult to ascertain the nature of the subjective symptoms. The affected parts evidently greatly annoyed the child. She would bite or rather gnaw them until they bled, and would rub them with her fingers until her hands were covered with blood. She would bite parts where no lesions were visible, as well. From the descriptions, it is difficult to decide whether this biting and rubbing were done to allay itching or on account of diminished sensibility of the parts. The extent to which bleeding could be excited without eliciting expressions of pain, would rather tell in favour of the latter condition. Ulcers similar to those upon the hands and feet developed upon the arms, and those upon the latter situations became worse about seven weeks ago. Ulcerations also made their appearance upon both legs near the malleoli.

She now remained without important change in the character of the ulcers, which remained inactive until about three weeks ago, when she was first seen by Dr. Chatard, to whose courtesy and intelligent observation I am indebted for the remaining history until the date of my own observation. During this period the teeth have appeared rapidly. She has cut eight since the beginning of her illness.

Dr. Chatard's treatment was addressed especially to the diarrhœa, which was plainly draining the strength of his patient, and, as this improved, the ulcers began to amend.

During the past two weeks, however, some new and very destructive ulceration has developed. The forefinger of the right hand, which had been excoriated by the teeth, began at this time suddenly to ulcerate at its second joint. The destruction of tissue, while not resembling gangrene, constituted so rapid a molecular disintegration that the tissues seemed literally to melt away, and by the second day the phalanx was laid bare, loosened from its attachments, and thrown off. In another twenty-four hours the terminal phalanx underwent a similar process. By the third day, the whole dorsal surface of the fingers was stripped from the bone. The destruction of tissue extended as far as the metacarpo-phalangeal joint, the tissues softening down into a yellow, greasy, purulent substance. Similar ulcerations, beginning with the formation of blebs with bloody contents, de-

veloped at the same time upon several of the toes and upon the right thumb, but have not advanced with the same celerity. It was at this time that Dr. Chatard's kindness gave me the opportunity of examining the case.

I found her emaciated and feeble, unable to stand, fretful, but apparently suffering but little pain. There was no febrile movement, though, during the attack, it was said to have been pretty constantly present. The tongue was enlarged, furred, and irregularly covered with small, inactive, superficial ulcerations. She continually rolled it about her mouth and projected it between her teeth. The gums and buccal mucous membrane were not ulcerated, and the teeth were firmly fixed in the jaw. There was no sponginess of the gums. The ulcer upon the face was unexcavated, smooth, red, secreting a scanty pus, and beginning to granulate at the edges. On the dorsal and flexor surfaces of the right wrist were ulcers of irregular jagged outline. These were as large as dime pieces, and were dry, pale pink, covered with a thin film, and absolutely inactive. Most of the small ulcers upon the fingers and hands were healed, leaving some infiltration and desquamation. Over the radial surface of the right wrist, which had been bitten, there was an ulcer, 5 cm. by 2.5 cm. in diameter, covered with a pale membrane-like, yellow deposit, slightly excavated and very inactive. Where granulations were visible, they were very pale. Upon the dorsum of the left thumb, involving the last phalanx, was a longitudinal ulcer, covered with a thick, yellow, fatty-looking deposit. This ulcer was quite deep. Upon the index finger, where the destructive ulceration began two weeks ago, the whole dorsal surface, as far as the metacarpo-phalangeal joint, was involved. The first phalanx protruded from the stump, and rested throughout its length upon a cushion of pale, inactive granulations, bathed in thin, yellow pus. For several days the ulceration had ceased to advance. There were no ulcers upon the arms, trunk, or thighs. Over the right external malleolus was the scar of an ulcer recently healed. Upon the right foot the ulcers had healed, leaving infiltration and desquamation. Those upon the left foot were in the same inactive condition as those upon the left hand. Upon the tip of the great toe was a circular ulcer, with a pale pinkish, smooth surface, and a scanty, yellow deposit. It was very inactive. Over the joint of the little toe was a similar ulcer.

The little patient seemed to have no sensation of pain in the affected parts, and, unless controlled, rubbed the raw surfaces with her hands until covered with blood. She likewise bit and gnawed her fingers and wrists without any expression of pain. A considerable degree of pinching seemed not to be painful. There was no anasarca. The heart was perfectly healthy. The urine was without sugar or albumen. Diarrhœa, though not so profuse as formerly, persisted to a slight extent. Whatever improvement was noticeable was said to have taken place during the past three weeks. Before that there had been no healing whatever.

Under attention to the general health and a wisely-selected diet, the child from this time improved, and in six weeks cicatrization was complete. Her nutrition improved, and she shortly became strong and vigorous. She is now (July, 1883) stout and hearty, though the scars of the old ulcers are abundantly present. A superficial scar extends over the chin and right cheek, extending obliquely upward and backward 9 cm., and vertically 6 cm. It has drawn the angle of the mouth slightly to one side, and gives a somewhat sinister expression to the countenance. Upon the dorsal and radial surface of both wrists are several large scars.

There are also scars upon the dorsal surface of the left thumb and index finger. Of the index finger there remains only the stump of the first phalanx. All the other fingers of both hands are intact, with perfect nails. There are scars just above the right ankle, externally and superficially, and upon the dorsal surfaces of the right toes, though the nails remain intact. Scars are also upon the dorsal surfaces of the left toes, and the nails of the great, second, and little toes are in great part destroyed. The child's general health is perfect and all its organs, as far as can be ascertained, in excellent condition.

As causes of this remarkable morbid condition, we may exclude mercurial intoxication and that from ergot or other medicaments which occasionally excite gangrene or destructive ulceration in those into whose bodies such agents have been introduced. Of ergot, it could not be ascertained that she had taken any. There was, possibly, a minute quantity of ammoniated mercury in an ointment she had employed, but symptoms of mercurial poisoning were not present. We may also reject diabetes mellitus as a possible cause of the symptoms. It was impossible to attribute the lesions to scurvy, for the child was most favourably situated as far as healthful lodging and food were concerned; and furthermore, the symptoms presented were not of the latter affection. To determine the true relations of the infrequent disease I have described, it will be necessary to briefly recapitulate its symptoms.

These were, first, a papulation and vesiculation, followed by a very superficial destruction of the epidermic structures and most external dermal tissue. This was followed, more or less rapidly, by ulceration of a progressive character, so that, in the highest degree, in a very short time, not only muscle, fibrous tissue, and cartilage, but even bone was destroyed. At no point was there gangrene in mass, if we may exclude the secondary destruction of bone, but, on the other hand, rapidly progressive molecular gangrene. This ulceration, while showing a tendency to affect similar parts of corresponding members and regions, could hardly be termed symmetrical. The right side of the face suffered much more severely than the left, while the left upper and lower extremities were decidedly more affected than those of the right side.

The extent to which motion and sensation were impaired was indeterminate. The child lost the power of locomotion, but whether from diminished nerve influence directly, or from increasing general debility, was not evident. Certainly there was no complete paralysis. Similarly with sensation, it was difficult to determine the true condition. That there was abnormal sensation was certain, but whether there was itching or paræsthesia was a matter of doubt. There were no scratch marks, nor was any expression of pain elicited upon handling the parts. On the other hand, there can be no doubt that the sensation of pain was decidedly blunted, as shown by insensibility to quite rough usage, and by the violence with which the child bit and rubbed her extremities, even to the production of

lesions and the copious discharge of blood. This bluntness of sensation extended beyond the area of lesions, and amounted to a decided numbness. Distinct symptoms of vaso-motor disturbance were not observed; the description of the mother, however, that the extremities became dry and wrinkled, is of significance, though it must be admitted that this was not observed by Dr. Chatard and myself. The colour of the child's skin would also doubtless interfere with the recognition of vaso-motor phenomena.

Though I have never encountered a similar case, I think there can be no doubt that this one belongs more directly to the group of affections which the late Oscar Simon first named "multiple cachectic gangrene." (*Breslauer ärztliche Zeitschrift*, No. 1, 1879.) This affection, according to the author quoted, attacks, almost exclusively, children between one and two years old, and begins with vesicles which dry into scabs. These fall off and leave a loss of substance of varying depth, in some cases even reaching to the bone. In all cases, cachexia may be recognized. (In two cases congenital syphilis was present.) Simon regards the process as a gangrene produced by a cachectic thrombosis. It is not unlike the forms of gangrene produced by ergot, morphia, or in the course of diabetes, typhus, or in paraplegics. The prognosis is good. The treatment should be principally of a tonic character.

Eichoff (*Deutsche med. Woch.*, No. 34, 1880) has recorded a case agreeing in its essential characters with the description of Simon, and yet having resemblances to my own case that would denote a close relationship.

His case, the interest of which will justify the rather extensive use I make of the abstract in the *Vierteljahrschrift f. Derm. u. Syph.*, 1880, p. 867, was a three-year-old girl, who had had an extensive eczema. The child's parents lived in the country, but being poor were unable to supply the necessary care and attention after its recovery from this complaint, and it gradually became more feeble, until a new attack of illness caused it to be brought to the clinic a month later. A few days previous to its admission, a considerable number of dark-red spots, varying between pinheads and beans in size, developed upon its back. At these spots, vesicles with serous contents quickly formed. These soon coalesced and became ulcerous. A gangrenous appearance was next assumed, and in a couple of days black sloughs were formed. After the removal of these sloughs, ulcers appeared with steep borders, which often extended deeply into the subcutaneous connective-tissue. Under appropriate simple treatment these ulcers healed, leaving variola-like scars. A few days after admission a corneal ulcer had appeared, with conjunctival irritation, pain and photophobia, and at the same time gangrenous ulcers appeared upon the scalp, and pursued the same course as those upon the back: from dark-red spots to vesicles, then ulcers covered with black sloughs, then fresh granulations, and, finally, depressed scars. Under tonics, in a fortnight, most of the ulcers had healed, a few remaining on the buttocks and scalp. At the end of two more weeks there was a relapse, during which gangrenous ulcers, larger and more numerous, appeared upon the scalp, which was covered with bean-sized ulcers with sharp borders, foul deposit, and ill-smelling secretions. An ulcer of the left cornea also appeared. Behind each ear the ulcers were more than an inch long. This exacerbation was accompanied by fever, which lasted a week, after which gradual improvement was noted, and the child was discharged, nearly well, three weeks later.

The only other case that I have been able to identify, as presenting close similarities with my case, was reported by Cæsar Boeck (*Norsk Magazin. f. Laegevideuck. Heft 10, 1881; Viertelj. f. Derm. u. Syph.*).

This patient was a little girl ten months old, and well nourished. Upon her back, breast, scalp (especially the vertex), and upon the flexor surface of the arm and forearm, were a mass of closely arranged efflorescences in different stages of development. At the same time there were numerous scars of various sizes and depth, closely resembling pockmarks. The history of the different lesions was as follows, viz., each lesion began with a somewhat elevated spot, which quickly formed a white vesicle. This seeming vesicle or little bleb had no cavity, however, but consisted mostly of swollen and softened epidermis, so that when it was destroyed only a minute amount of serous fluid could be detected. When the vesicle attained a certain size, it began to flatten and sink in the centre, where a brown crust began to form. There was thus presented a striking resemblance to a vaccine pustule of the ninth or tenth day. This crust soon covered the entire lesion. As it began to loosen, a more or less deep gangrene became evident. The slough was thrown off by a profuse suppuration. Upon the scalp this gangrene involved the periosteum, so that superficial necrosis of the bone resulted. After the removal of the slough there remained quite deep ulcerations with sharp undermined edges, which healed with slow granulation. In the axillæ the ulcers were very deep, extending into the subcutaneous tissue. The lesions were most extensive upon the scalp, where, at the time of writing, several scars measured from one to two cm. in diameter. The course of the affection was slow, in consequence of the frequent occurrence of new lesions. The disease had first shown itself about six months previously upon the right cheek, as a single, but extensive lesion, the recently healed, discoid, deep scar of which remained, about one cm. in diameter. About a fortnight later, the disease attacked the scalp and back, and slowly spread to all the mentioned localities. The disease had by no means shown so perfect a symmetry that one could attribute it, with confidence, to altered nerve influence. In the scanty serous secretion from the freshly formed vesicles, were formed numerous micrococci, which, however, did not differ from the common micrococci to be found in nearly all cutaneous centres of inflammation. The author attributed no special significance to their presence. Boeck could not, however, adopt Simon's theory of a cachectic thrombosis of the cutaneous vessels as the cause of the lesions. The little patient could be called neither cachectic nor marasmic, and her condition of life was, upon the whole, good.

At the time this patient was treated, there was another case of the same disease in the out-patient department of the University Clinic. This was a girl, one year old, much reduced and cachectic. This child had as in Eichhoff's case, a phlyctenular keratitis. It was affected with the disease during many months.

It is impossible not to recognize a relationship between these cases and the one I have given, although in the latter gangrene in mass did not occur. This difference would mark, however, variation in intensity only, the gangrene in the least intense case being molecular in character. It is likewise impossible to avoid the conclusion that these cases form one extreme of a series of morbid processes of which the symmetrical gangrene of Raynaud constitutes the other. Since 1862, this affection has attracted some attention, though but a limited number of cases of it have been reported. It has received notice in France from Brehier (*Thèse de Paris, 1874*), Mougeot (*Thèse de Paris, 1867*), Foulquier (*Thèse de Paris, 1874*).

a second time by Raynaud (*Arch. Gén. de Paris*, 1874), Déjérine and Leloir (*Arch. Gén. de Physiol.* 1881, No. 6), and others; in Germany, from Estlander (*Arch. f. klin. Chir.* 1870, xii. 453), Hastreiter (*Wiener med. Presse*, 1882, No. 33), Rinecker, Nedophil, Fischer, Englisch, and other writers, more especially by Weiss (who has made it the subject of a double number of Schnitzler's lectures), and from a number of others in different countries. The characters of the malady are admirably given in synopsis by Weiss, who says (Ueber symmetrische Gangrän, *Weiner Klinik*): "by 'symmetrical gangrene' is understood a neurosis of the central nervous system, the anatomical basis of which has not yet been discovered, which is manifested, clinically, by numerous vaso-motor, trophic, and sensory disturbances as well as by alterations of the nerves of special sense, and which involves symmetrical (for the most part) portions of the hands and feet (phalanges), more rarely other regions of the body, in gangrene of a peculiar character." I am again indebted to Weiss for a synopsis of the case that served Raynaud for a type of the disease, and which I may be allowed to reproduce, as it will serve for an admirable contrast and comparison with the cases already related.

It was as follows:—

"A woman, twenty-seven years old, who had menstruated regularly since her fourteenth year, experienced four months after her first confinement (February, 1859) paræsthesia of the fingers. Pain soon developed in them, and in a few days increased in intensity, so as to destroy the night's rest in spite of the use of laudanum. Several fingers became 'numb,' and later the terminal phalanges became of an intensely dark colour. The tip of the nose also became black at the same time, without becoming painful. By the end of March a similar change appeared in the feet. The toes grew painful, and the terminal phalanges black. In the beginning of April the dorsal surfaces of the end phalanges and the pulps of the fingers developed pin-head sized sloughs, and upon the dorsal surfaces of the three middle toes, the epidermis was raised in blebs containing bloody serum, which gradually dried into black scabs. Later on the same process involved both great toes. A small slough also appeared upon the buttock; while upon the fingers the gangrene remained limited to the superficial layers of the cutis, and did not spread; that upon the toes spread so much in surface and depth, that by the beginning of June the end phalanges of the four first toes of both feet had sloughed, so that when the line of demarcation was established at the second phalanx they hung from the healthy parts like charred bits. The necrotic parts were removed, and healing quickly followed. The pulse throughout the disease showed no abnormality; the heart was normal; the temperature was always normal; the urine contained neither sugar nor albumen. The patient had only once taken ergot (1.50 grams after her confinement). She remained healthy after recovery without a relapse."

This symmetrical gangrene is usually associated with various vaso-motor disorders, spasm of the small arteries, occasioning anæmia; of the small veins, giving rise to passive hyperæmia; or by implication of vaso-motor centres paralytic hyperæmia, as well as by disturbances of general nutrition of various degrees.

While, however, there seems to be but little doubt that all these disorders have a more or less similar genetic history, it remains a matter of

the greatest difficulty to determine the definite pathological process upon which they depend.

Dégérine (*Le Progrès Méd.* 1882, No. 6) studied changes in sloughs, depending upon determinate alterations in the central nervous system. He examined, one hour after death, portions of skin affected with gangrene from a case of cerebral hemorrhage, and from one of sclerosis in patches. He found parenchymatous neuritis affecting all the nerve tubes, both nearest the slough, and as far as from 7 to 8 cm. above it. This author, together with Leloir (*Archives de Physiologie*, 1881, p. 1011), claims that "the eschars result from a profound alteration of the trophic influence exerted by the nervous system over the nutrition of the skin. Vaso-motor paralysis, compression, troubles of sensations, contact of the skin with urine, may play an accessory rôle in the production of eschars. The cause is parenchymatous neuritis (atrophic neuritis), with ordinary characters." And again, they say, "a peripheral primitive neuritis was the cause of the gangrene." The changes in the parenchymatous neuritis, they assert, depend "nearly always upon alterations of the trophic centres of nerves; or, what amounts to the same thing, an alteration affecting the continuity of these, and separating the subjacent extremity from the trophic influence."

While parenchymatous neuritis may account for the necrotic changes in cases such as served for the investigations of these authors, cases where gross lesions of the nervous system were discovered after death, or which were accompanied during life by nervous symptoms indicating profound and permanent alterations, it is exceedingly improbable that the class of cases we have been considering can have any such origin. They usually end in perfect recovery; they are never accompanied by gross lesions of the nervous system; they do not exhibit the symptoms of parenchymatous neuritis, usually quite recognizable.

It is also exceedingly improbable that either thrombosis or embolism can constitute a determining cause in the production of the symptoms, since, upon the one hand, there have been detected no centres whence emboli could have been derived, and, upon the other, in parts presenting so abundantly channels for the establishment of collateral circulation, it is difficult to imagine how a thrombosis capable of producing gangrene could occur *primarily*.

For the present, it would appear that these cases should be assigned a place in that already numerous class, the neuroses; though, whether they depend upon alterations in the vaso-motor system, or in that still indeterminate system of trophic nerves, cannot as yet be decided. One difficulty in the way of accepting the theory of trophic nerve influence has been, to some extent, surmounted by the suggestion that separate trophic fibres are not essential for the propagation of the impulse from trophic

nerve-centres, but that the ordinary nerve-fibres may serve as the medium of communication.

Mere spasm of bloodvessels, whether arterial and producing anæmia, or venous and producing mechanical hyperæmia, cannot be capable of producing gangrene, as is shown by the every-day experience that either of these conditions may persist for hours, and even days, and yet not bring about any tendency toward gangrene. It is possible, however, that a temporary interference with the nutrition of parts, from whatever cause, may occasion their death, if they are already enfeebled in their powers of resistance, whether from arrested trophic nerve influence or from lowering of their own intrinsic vitality. In this connection it is of interest to observe, that in many cases of non-traumatic gangrene the death takes place in parts subject to undue deleterious influences from without (the skin more especially), in individuals whose sources of nutrition have undergone deterioration, as in typhoid fever, etc.

In the absence of definite knowledge, however, of the pathogenesis of these and kindred lesions, and in view of the unmistakable vaso-motor disturbances observable in the more pronounced forms of the affection known as symmetrical gangrene of Raynaud, we can do no better than provisionally accept the very lucid theory of Weiss, according to whom the disease is a neurosis, in which the vaso-motor centre is, from whatever cause, readily thrown into a state of hypertonus; the importance of the symptoms depending upon the dignity of the parts upon which the vascular spasm is developed. Contraction of the cutaneous arteries will produce a bloodless condition of the skin. By venous spasm is produced local cyanosis, and by contraction of vaso-dilators local active hyperæmia. Similarly, by vascular spasm of those portions of the posterior columns standing in functional relation with the skin, will be produced nutritive disturbances of the skin and epidermic structures (*loc. cit.*, pp. 391-392).

In giving this article a title, I have retained the term "cachectic," as originally proposed by Simon, for "multiple cutaneous gangrene," in order that the relationship of the cases should be kept in mind. It is by no means certain, however, that any condition of cachexia, as ordinarily understood, is necessarily present.

ARTICLE III.

THE VISUAL AREA IN THE BRAIN DETERMINED BY A STUDY OF HEMIANOPSIA. By M. ALLEN STARR, A.M., M.D., late House Physician, Bellevue Hospital, and Attending Physician New York Dispensary.

RECENT research in cerebral physiology has been directed toward the subject of the localization of sensory areas on the cortex of the brain, and

has been productive of many very interesting discoveries. The investigations of Wernicke and Stilling in the anatomy of the brain, and the observations of numerous pathologists in cases of hemianopsia have confirmed in such a striking manner the conclusions of the physiologist, Munk, regarding the cortical area governing vision, that a summary of the facts deserves attention. A knowledge of these facts is necessary both for the exact examination of cases and for an accurate record of autopsies; as it seems probable that many errors in the past have been due to the imperfect investigation of symptoms and of lesions.

The experiments of Munk, first announced in 1878,¹ awakened so much criticism that he deemed it necessary to repeat them, especially as they differed in their results from those of Ferrier.² In 1881 a second series of researches was reported by him confirming his first conclusions,³ while in the same year Ferrier was led by further experiments to modify his earlier statements,⁴ and to bring them more nearly into accord with those of the German physiologist. At the recent July meeting of the Physiological Society of Berlin (1883) Munk made a final statement summing up the result of the work of the past seven years,⁵ and demonstrating the accuracy of his conclusions. These may be stated as follows:—

“1. The occipital lobes of the brain are necessary for the perception of visual impressions. Destruction of both occipital lobes produces total and permanent blindness.

“2. Each occipital lobe is in functional relation with both eyes in such a manner that corresponding halves of both retinal areas are projected upon the cortex of the lobe of the like-named side; *e. g.*, destruction of the left lobe produces loss of function of the left halves of both retinae.

“3. On the cortex of each occipital lobe the anterior segment corresponds to the upper half of the retinae; the posterior to the lower half; the external half to the temporal half of the eye of the same side, and the internal half to the nasal half of the eye of the opposite side. Even though ever so small portions of the sections of the cortex in question were removed the corresponding part of the retina would be rendered blind. In time the animal learns to make up for the defects caused by operations, and with the remaining unaffected parts of the retina will contrive to see so well and act in general in such a way as to superficial observation to convey the impression of an animal endowed with normal powers of sight. On close examination, however, of the particular parts of the retina it will be found in every case that the part corresponding with the excised part of the cortex is blind. Functional restoration of an excised part of the cortex never occurs.”

It is not necessary to give in detail the method pursued in reaching these conclusions. It may be stated that the animals experimented upon were dogs and monkeys, and that the results in both led to the same conclusions; it being found, however, that, as in dogs, the majority of the optic fibres decussate at the chiasm, each occipital lobe was in closer functional

¹ Verhandl. d. Physiol. Gesellsch. zu Berlin, 1878–79, Nos. 4–5.

² Ferrier, Functions of the Brain, 1876, pp. 164–171.

³ Verrichtungen des Gehirns, Berlin, 1881.

⁴ Cerebral Amblyopia and Hemiopia, Brain, Jan. 1881.

⁵ See Report in Nature, Aug. 30, 1883.

relationship with the eye of the opposite side than in monkeys, whose optic decussation resembles that of man in being partial. A strong point in support of these conclusions is drawn from the fact that Munk kept his animals alive for from one to five years after the operation, watching them carefully for signs of recovery, and distinguishing the temporary effects of the operation from the permanent effects of the lesion. He thus escapes the criticism which is rightly urged against the experiments of Ferrier by Goltz. The large number of animals used, the uniform result of the experiments in all cases, the length of time during which the symptoms persisted, and the minute care displayed in the observations combine to establish the truth of the conclusions reached.

It remains for the pathologist to determine whether these facts, which are true in the case of monkeys, are true also in the case of man. Nature's experiments in the form of disease, when carefully studied, supply the necessary conditions and facts to determine this question. During the past four years a large number of cases have been reported with full records of autopsies, which are of great value in establishing the fact that the function of vision in man is performed by the occipital lobes of the brain. Before examining these cases, however, a brief review of the anatomy of the optic tract may be of service, in order to call attention to a recent discovery of Wernicke.

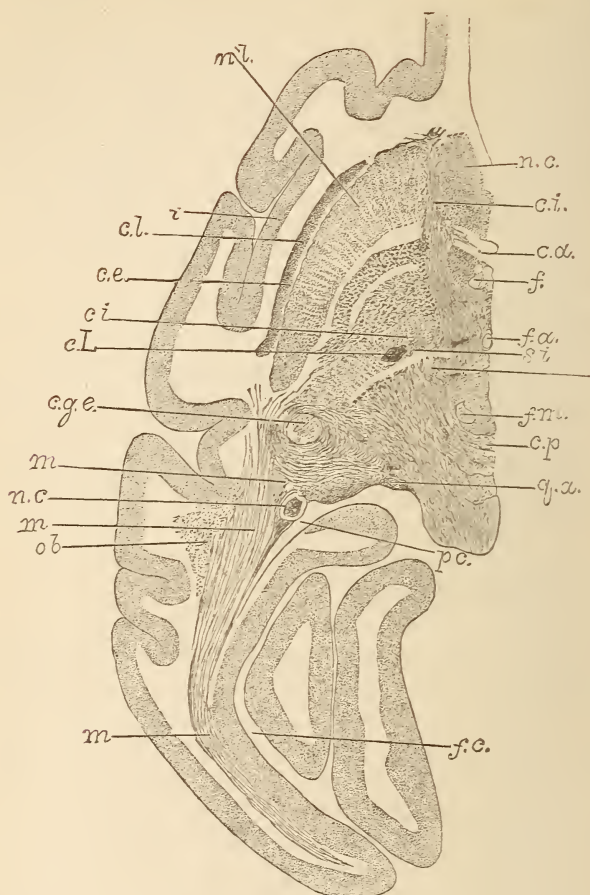
It has long been taught that the decussation of the optic nerves in the chiasm is partial; and that the optic tracts, beginning at the chiasm, terminate in the corpora geniculata, in the posterior *outer* third of the optic thalamus (the pulvinar), and in the corpora quadrigemina.¹ The direct connection of these central ganglia with the cortex by means of a white tract passing outward from the thalamus and backward to the occipital lobe has been lately proved by Wernicke.² His discovery is confirmed by Stilling and Wilbrand, and is a striking confirmation of the earlier statements of Gratiolet and Meynert, Fig. 1. It is therefore possible to follow the course of the optic fibres from the chiasm to the occipital lobe. This course is further corroborated by a case reported by Huguenin,³ in which, after blindness of the left eye of fifty years' duration, both occipital lobes were found to be atrophied. The atrophy consisted of a diminution both in the size of the convolutions and in the thickness of their cortex, and was greater in the right hemisphere. The test of pathology thus establishes the existence of a direct anatomical connection between one eye and both occipital lobes. Several cases of atrophy of both occipital

¹ The existence of fibres from the optic tract to the pons and olivary body—the *radix descendens nervi optici* of Stilling—is still under examination. It is uncertain whether the fibres passing from the tract to the basal optic ganglia of Meynert and to the corpora Luysii are connected with sight.

² Wernicke, *Gehirnkrankheiten*, Anatom. Theil. i. pp. 79–85, 1881.

³ Nothnagel, *Topische Diagnostik d. Gehirns*, p. 476.

Fig. 1.

HORIZONTAL SECTION OF A BRAIN OF A MONKEY. (After Wernicke. $\frac{2}{1}$.)

n. c. Nucleus caudatus; *c. i.* capsula interna; *f.* fornix; *f. a.* fornix ascendans; *c. a.* commissure anterior; *c. p.* com. posterior; *s. i.* bundle of fibres from *n. l.* to the tegmentum; *f. m.* Meynert's bundle; *q. a.* corp. quadrigemina ant.; *p. c.* posterior cornu of lateral ventricle; *f. c.* fissura calcarina; *o. b.* crosscut fibres to lower occipital lobe; *m.* direct medullary fibres to occipital lobe; *c. g. e.* corp. genic. ext.; *c. l.* corpus Luysii; *c. e.* capsula externa; *c. l.* claustrum; *i.* island of Reil.

lobes after total blindness of long duration are on record.¹ It would therefore appear to be a matter of anatomical necessity that impressions received in each eye should be conveyed to both occipital lobes of the brain.

But pathology furnishes even more convincing proof of the functional

¹ Nothnagle, *Topische Diagnostik d. Gehirns*, s. 389. Griesinger, *Hirnkrankh.* s. 365. Moore, *Jahresbericht v. Virchow*, xiv. i. 91. Mickle, *Med. Times and Gaz.*, 1882, Jan. 28; in this one alone were the angular gyri also involved.

connection of the occipital lobes with vision. The peculiar symptoms of blindness in the corresponding halves of both eyes, called "lateral homonymous hemianopsia," was long thought to be due in every case to a destruction of one optic tract.¹ Prior to five years ago all the cases on record supported this conclusion. Since that time numerous cases have been published which demonstrate that it may also be produced by a lesion of the pulvinar of one optic thalamus, or by a lesion of one occipital lobe, situated either in its white matter (*i. e.*, in the direct tract of Wernicke) or in its cortex. They also prove that each occipital lobe is in functional connection with both eyes, and not with the eye of the side opposite to it only, as has been formerly supposed. No summary of these cases has appeared in English. In order to demonstrate their value in determining the visual area of the brain they are cited here; only those cases being given which are accompanied by a record of autopsy.

I. First Group. Hemianopsia with Lesion of one Optic Thalamus.

CASE 1. Male, æt. 62. Left hemianopsia; field of vision limited by a vertical line passing through the fixation point. No other symptoms.

Autopsy.—Hemorrhage in the posterior part of the right optic thalamus, and in the corpus striatum. Optic tracts normal. (Pflüger; Augenklinik in Bern, 1878, cited by Marchand. *Graefe's Archiv für Ophthalmologie*, xxviii. 2.)

CASE 2. Male, æt. 75. Left hemianopsia; field of vision limited by a line passing vertically through the fixation point. Other symptoms: left hemianæsthesia and hemiparesis. Symptoms all remained three years.

Autopsy.—Area of softening with atrophy, limited strictly to the posterior half of the right optic thalamus, and destroying the pulvinar. All other parts of the brain, including the optic tracts, normal. (Hughlings-Jackson, *Lond. Ophthalm. Hosp. Rep.*, viii.)

CASE 3. Male, æt. 50. Left hemianopsia coming on suddenly, and associated with aphasia, left hemiplegia and anæsthesia of left arm and leg. The loss of vision in the left half of both fields of vision was complete, and was limited by a vertical line passing just to the left of the point of fixation. Central vision good. Pupils normal. The aphasia disappeared, but the hemiplegia increased in degree until death, two weeks after the attack.

Autopsy.—Oval clot 4 x 3 x 3 lines was found in the posterior and upper extremity of the right optic thalamus, quite within the pulvinar. Corp. quad., corp. genic., and optic tracts normal. Three other small hemorrhagic spots were found in the right centrum ovale in the course of the motor fibres passing to the central convolutions. These were the cause of the hemiplegia, while the hemianopsia was due to lesion of the thalamus. (Dreschfeld, *Brain*, vol. iv., No. 4, p. 549.)

CASE 4. Male, æt. 55. Right hemianopsia; field of vision limited by a vertical line passing through the fixation point. Other symptoms: paresis of entire right half of body; anæsthesia of right arm; disturbance of speech; epileptiform convulsions and mania. Death after seven months.

Autopsy.—Tumour (gumma) in the left occipital lobe, surrounded by a very extensive zone of softening which involved the parietal lobe, and extended inward to the left optic thalamus, which was softened. Optic chiasm and tracts normal. (Pooley, *Knapp's Archiv. of Ophthalm.*, vi. p. 27.)

CASE 5. Male, æt. 42. Right hemianopsia; central vision good. Other symptoms: aphasia; right complete hemiplegia, with facial paralysis.

Autopsy.—Tumour in left occipital lobe surrounded by a zone of softening, reaching inward to and involving the pulvinar of the left optic thalamus. Optic tracts normal. (Hirschberg, *Deut. Zeitsch. f. Prac. Med.*, 1878, No. 4.)

¹ This error is reaffirmed by A. L. Ranney, M.D., N. Y. Med. Record, Aug. 18, 1883.

The last two cases would be placed in our second group, did not both Pooley and Hirschberg refer the hemianopsia to the lesion of the optic thalamus.

II. Second Group. Lesions of the Occipital Lobe.

CASE 1. Male, æt. 64. Right hemianopsia with right hemiplegia and aphasia.

Autopsy.—An embolus in the left sylvian artery had produced an area of softening in the left hemisphere, involving the corpus striatum, external capsule, and centrum ovale. An area of softening was also found in the anterior part of the left occipital lobe in its white substance. Island of Reil, optic tracts and chiasm normal. (Förster, cited by Grasset; *Montpellier Medical*, Feb. 1883.)

CASE 2. Female, æt. 46. Right hemianopsia, limited by vertical line through fixation point. Other symptoms: aphasia; complete right hemiplegia with anæsthesia, following a sudden loss of consciousness, with right unilateral convulsion. Patient lived three months after.

Autopsy.—Embolus in the left sylvian artery, with softening of the area supplied by it, viz., the posterior part of the inferior frontal; the inferior part of both central; the anterior part of the gyrus supra marginalis and the island of Reil. The area of softening extended inward to the nucleus lenticularis, and backward into the white matter of the parietal lobe. (Huguenin, *Ziemssen's Cyclop.*, xi. p. 797.)

The area of softening probably reached the direct medullary tract of Wernicke lying beneath the supra-marginal gyrus at its posterior extremity, and thus produced the hemianopsia in both of these cases.

CASE 3. Right hemianopsia occurring suddenly, with headache and drowsiness. Later aphasia developed.

Autopsy.—In the left hemisphere a hemorrhage had destroyed the greater part of the corona radiata, including the posterior fibres to the occipital lobe, and had penetrated into the parietal lobe, nearly reaching the island of Reil. Other parts of the brain normal. (Dmitrowsky, cited by Wilbrand, *Hemianopsie*, p. 477.)

CASE 4. Female, æt. 69. Sudden attack of complete right hemiplegia, with anæsthesia, including the face, followed by left hemichorea of both arm and leg, which persisted during sleep, and left a hyperæsthesia. The left eye had long been blind from pannus, but a lateral right hemianopsia of the right eye accompanied the apoplectic attack. The hearing was diminished in the right ear. Patient was very stupid, but lived 32 days after the attack.

Autopsy.—The entire left occipital lobe, the parietal convolutions, and the central convolutions were softened from embolism of the art. fossa. syl. and the art. med. sinist. The basal ganglia and the internal capsule, in its entire extent, were included in the softened area. (Birch-Hirschfeld, cited by Vetter. *Deut. Arch. f. Klin. Med.*, xxxiii. 507.)

CASE 5. Female, was suddenly seized with amnesic aphasia, without any affection of motion or sensation. Smell and taste were normal, but she no longer looked directly at objects or persons, but constantly kept both eyes turned to the left, there being, however, no paralysis of the ocular muscles. In grasping things to the right of her she would miss them, and have to correct herself by turning her head, in order to see them. Ophthalmoscopic examination negative. The author attributed the position of the eyes to right hemianopsia.

Autopsy.—Embolism of the parieto-sphenoid branch of the left sylvian artery. The entire left lower parietal lobule was softened, especially in its cortex, and the softening encroached upon the cortex of the second occipital convolution to a considerable extent. (Fritsch, cited by Wilbrand, *Hemianopsie*, p. 144.)

CASE 6. Male, æt. 50. Right hemianopsia. Other symptoms were aphasia, complete loss of muscular sense in the right arm, and attacks of right unilateral convulsions which left the patient hemiplegic for a few days, after which he would regain his power in the right side. Death occurred several months after.

Autopsy.—The pia mater was adherent over the entire left hemisphere, and the cortex was in a condition of yellow softening, and was atrophied in the entire parietal, in the greater part of the occipital, and in a portion of the temporo-sphenoidal regions. The angular gyrus was less involved than the other parts. Westphal refers the hemianopsia to the lesion of the occipital lobe. (Westphal, *Charité Annalen*, 1882. *Brain*, July, 1882, p. 281.)

CASE 7. Hughes reports a case in which, after a compound fracture of the skull in the occipital region, two pieces of bone were elevated and removed on the left side. There was much laceration, and some loss of brain-substance in this region. The patient recovered, but a right hemianopsia remained. Cited by Wilbrand. (*Hemianopsia*, p. 142.)¹

CASE 8. Male, æt. 64. Right hemianopsia, limited by a vertical line passing 5° to the right of the fixation point. To the right of this line was a zone 10° – 15° broad in both eyes, in which perception of light was possible, though much impaired. The periphery of the visual field of the left eye was narrowed about 5° – 10° . This condition continued twenty months, during which the degree of the hemianopsia varied somewhat, the width of the vertical zones of indistinct vision and the peripheral defect in the left eye at times decreasing and then recurring. The limiting line did not change its position. Other symptoms were at first agraphia, aphasia, and alexia, of which the first only had disappeared at the time of death. Toward the close of life, a right hemiplegia developed gradually, affecting the arm more than the leg.

Autopsy.—A softened area on the cortex of the posterior part of the left hemisphere involved the occipital, parietal, and temporal convolutions, at their junction, two-thirds of it being located in the occipital cortex, upon the convexity. The area was irregular in outline, and did not destroy the angular gyrus. The centre of the convexity of the occipital lobe was its principal seat, but the convolutions joining the occipital lobe with the second temporal and inferior parietal, as well as the posterior parts of both these convolutions, were involved. The softening extended inward through the white substance, and reached the ependyma of the post. cornu of the lateral ventricle, thus involving the direct medullary tract of Wernicke for a breadth of two cm. A second area of softening in the external capsule encroached on the nucleus lenticularis, and the anterior part of the internal capsule. In the white matter of the anterior central convolution were two more small centres of softening. A descending degeneration was followed from the internal capsule into the pons. Thalamus and optic tract normal. (Wernicke, *Gehirnkrankheiten*, ii. 190–195.)

CASE 9. Male, æt. 42. Right hemianopsia not quite reaching the point of fixation. Central vision good in both eyes. Ophthalmoscopic examination negative. Other symptoms: vertigo, loss of memory, aphasia, and partial agraphia with temporary right hemiplegia.

Autopsy.—In the left occipital lobe, involving all three of its convolutions, as well as the præcuneus, was found a gelatinous sarcoma. A wedge-shaped area of softening extended inward through the white substance to the posterior cornu of the lateral ventricle. Thalamus and optic tracts normal. (Jastrowitz, *Arch. f. Augenheilkunde*, 1877, p. 254.)

CASE 10. Male, æt. 51. Right hemianopsia limited in the left eye by a line passing through the point of central vision, and in the right eye by a line passing 10° to the right of this point. Ophthalmoscopic examination negative. Other symptoms: monoplegia of the left arm, with vaso-motor paralysis. The paralysis was referred to a loss of the muscular sense. No disturbance of sensibility but paræsthesiæ of the entire arm. Gradual development of a condition of dementia and apparent increase of the degree of blindness, the extent of which could not be determined, on account of the mental condition of the patient. Death after two months.

¹ A similar case is reported by Nieden, Graefe's *Arch. f. Ophthal.*, xxix. p. 143. The case of Keen and Thompson, *Surg. Hist. of the War*, I. 270, is without autopsy, and the course of the ball was too indefinite to warrant any conclusion as to the lesion.

Autopsy.—The entire left occipital lobe as far forward as the sulcus parieto-occipitalis, both on its surface and in its substance, was found in a condition of yellow and grayish-white softening. A second area of softening, involving the middle third of the right anterior central convolution, explained the monoplegia. Two other small areas of softening were found in the right hemisphere: one in the superior parietal lobule; the other in the third occipital convolution. A recent hemorrhage in the right optic thalamus was the cause of death. Optic tracts normal. (Nothnagel, *Topische Diagnostik d. Gehirnk.*, p. 390.)

CASE 11. Male, æt. 45. Right hemianopsia. Other symptoms developed later were right hemiparesis with anæsthesia going on to complete hemiplegia. Fever and headache. Diagnosis was made of an abscess in the left occipital lobe. The left parietal bone was trephined at its post. sup. angle; the abscess was found and evacuated, with temporary relief of the hemiplegia. The hemianopsia remained till death, two weeks after the operation.

Autopsy.—In the left occipital lobe involving also the posterior part of the inferior parietal lobe was found an abscess of tubercular origin with ragged walls. On the convexity of the left occipital lobe numerous tubercles were found embedded in the cortex. Optic thalami and tracts normal. (Wernicke u. Hahn., *Virchow's Archiv*, vol. 87, p. 335.)

CASE 12. Female, æt. 21. Right hemianopsia. Central vision good. Other symptoms: headache, dysarthria, anæsthesia of the right half of the face. No paralysis; no mental symptoms. Choked disks. Death after seven months.

Autopsy.—A cystic glioma was found in the left occipital lobe which had reached and destroyed the cortex of the lobe at its apex, and had extended inward nearly reaching the inferior cornu of the lateral ventricle. The entire inner half of the occipital lobe was thus destroyed. (Jany, Knapp's *Archiv f. Augenheilk.*, xi. p. 190.)

CASE 13. Female, after an apoplectic attack was unable to talk distinctly, was partly paralyzed in the right hand, and unable to perceive sensations in the right half of the body. She only saw one half of objects. This condition lasted two and a half years, when after a second apoplexy accompanied by total right hemiplegia she died of pneumonia. The hemianopsia continued till death.

Autopsy.—Membranes not adherent to the brain. On the median surface of the left occipital lobe there was a large area in which the brain substance was missing; and the lateral ventricle was separated from the pia mater only by a thickened ependyma to which debris of brain tissue was adherent. A cyst was found in the right superior lobe of the cerebellum. Other lesions of a more recent date were two small centres of softening in the left optic thalamus, and a small cyst in the left corpus striatum. (Chaillou, *Bull. d. l. Soc. Anat. de Paris*, 1863, Feb. *Procès Verbal*.)

CASE 14. Male, æt. 69, was admitted to la Charité Hospital, Berlin, four months after an attack of left hemiplegia with partial aphasia; when in addition to these symptoms and mental weakness it was noticed that the patient's eyes were constantly turned to the right, though the muscles of the eyes were not paralyzed. Examination revealed a left hemianopsia. Sensation on the left side could not be tested on account of his mental condition. Later ataxia and paresis of the right arm and leg developed, and febrile symptoms with delirium terminated in death six months after the attack.

Autopsy.—General atrophy of the convolutions. Arteries atheromatous. In the middle of the second right temporal convolution a discoloration was visible; and on section a large hemorrhagic spot of softening was found which had destroyed the greater part of the substance of the temporal lobe, and had extended backward into the occipital and upward into the parietal centrum ovale without

¹ The side on which the hemianopsia was is not stated in the original. The report is: "Elle ne pouvait plus voir à la fois, disait elle, deux objets faiblement éloignés l'un de l'autre, et n'apercevait constamment qu'une moitié de la figure des gens qui la regardaient." M. Bellouard, *L'Hémianopsie*. Thèse de Paris, 1881, cites the case as one of left hemianopsia. It must have been a right hemianopsia judging from the lesion found.

breaking into the lateral ventricle. Internally it had destroyed the posterior third of the internal capsule and the direct medullary tract of Wernicke without involving the optic thalamus. The right corpus geniculatum externum was in a state of red softening. The third member of the nucleus lenticularis and the external capsule were also injured. (Senator, cited by Wernicke, l. c. ii. 70.)

CASE 15. Female, æt. 70, after an apoplectic attack lost the powers of motion and sensation in the entire left half of the body. There was ptosis of the left eyelid and apparent blindness of the left eye, but with the right eye patient could see. During the following fortnight the powers of sensation and motion returned, excepting in the left arm; the ptosis disappeared, and vision was partly regained in the left eye. It was then found that the patient had left hemianopsia in both eyes. Subjective sensations of light annoyed her much. In the left arm contraction of the flexors developed. Headache increasing in intensity was followed by convulsions, and in three weeks the patient died.

Autopsy.—The right hemisphere was much softer than normal, especially in the white matter on the roof of the lateral ventricle; and the softening reached as far back as the posterior part of the occipital lobe. The right optic thalamus, and a part of the lenticular nucleus were also softened. There was also a small area of softening "in the upper part of the left hemisphere." Nowhere any hemorrhages. No ventricular effusion. (Lallemande, cited by Wernicke, l. c. ii. 189.)

CASE 16. Male, æt. 40. Suffered for seven years before death from epileptic seizures beginning with spasm of the left leg, and going on to general convulsions, in which, however, the motions were always more violent on the left side. An aura consisting of a darkness coming gradually over the field of vision from the left side always preceded the attack. During the intervals left-sided headache was the chief symptom. It seems probable that a temporary left hemianopsia preceded the attack.

Autopsy.—In the white matter of the right occipital lobe was found a cyst of the size of an apple, filled with serum, and surrounded by a zone of softening which did not involve either the cortex or the wall of the lateral ventricle. All other parts of the brain normal. (Traube, *Gesammt. Beiträge zu Pathologie*, ii. 1083.)

CASE 17. Male, æt. 72. Left hemianopsia occurring suddenly with left hemiplegia. Patient lived several months without recovering.

Autopsy.—Pia mater over the right occipital lobe congested but not adherent. The convolutions posterior to the fissure of Rolando, on the right side, were softened and the vessels injected. At the apex of the right occipital lobe was a spot of necrosis of the size of a hazel-nut, surrounded by a zone of yellow degeneration which extended over the surface of the neighbouring convolutions on the convexity of the lobe. The softening was superficial, and did not extend deeply into the white matter. A small cysticercus 5 mm. in diameter was found on the inferior surface of the left anterior lobe external to the olfactory bulb; no other lesion. The optic thalami and tracts normal. (Marchand, *Graefes Arch. f. Ophthalm.*, xxviii. 2.)

CASE 18. Female, æt. 8, of tubercular parentage, became irritable and stupid, began to suffer from headache, and two months later was attacked with general convulsions which occurred every few days. Her mental condition became much impaired, but no paralysis or anaesthesia was detected. For six weeks before her death there was left hemianopsia.

Autopsy.—A tubercular tumour 3 by 3 by 2.5 cm. was found on the median surface of the apex of the right occipital lobe in the sulcus hippocampi whose sides it separated. It was surrounded by a zone of yellowish-red softening which was limited to the cortex and did not involve the white matter. A second smaller tubercle lay at the apex of the right second frontal convolution. Optic thalami, tracts, and chiasm normal. (Haab, *Klin. Monatsbl. f. Augenheilk.*, xx. 5.)

CASE 19. Female, æt. 61. Left hemianopsia occurring suddenly with left hemiplegia. The latter disappeared, but the former remained one year, until death. The field of vision was limited by a vertical line passing through the fixation point in both eyes.

Autopsy.—On the median surface at the apex of the right occipital lobe was found a cyst surrounded by an extensive oval area of softening measuring 6 by 3 cm. The cortex about the sulcus hippocampi was destroyed. The softening was limited to the cortex, a tract of normal white substance lying between it and the posterior cornu of the lateral ventricle. The optic thalami, corp. quadrigemina and geniculata, and the optic tracts normal. (Haab, *Klin. Monatsbl. f. Augenheilk.*, xx. 5.)

CASE 20. Male, æt. 32. After an apoplectic attack accompanied by fever there remained left hemianopsia with left hemiparesis. During the next three months the patient suffered from left unilateral convulsions at intervals. Then after such a convulsion right hemianopsia appeared, leaving the patient totally blind until his death one month after. Convulsions of the right arm and face occurred during the last month, and twice the patient had visual hallucinations. There was no other sensory disturbances.

Autopsy.—The brain was oedematous. The pia mater was thickened and opaque in spots over the convexity. Over the left parietal and both occipital lobes the pia mater was deeply congested and firmly adherent to the cortex so that the latter was torn in removing it. The entire cortex of both occipital lobes was very soft and markedly atrophied, the right one more than the left. The medullary substance of both occipital lobes was soft and atrophied, and the post. cornua of the lateral ventricles were distended with serum. Both optic thalami were soft and atrophied in their posterior third. Both optic tracts normal. (Stenger, *Arch. f. Psych.*, xiii. s. 245.)

CASE 21. Male, æt. 52, who had been subject to epilepsy for years, had an attack of left unilateral convulsions without loss of consciousness, followed by paresis of the left leg, paralysis of the left arm, and paræsthesiæ in the left hand. The unilateral convulsions recurred daily for 13 days, when left hemianopsia suddenly developed, and a total loss of muscular sense in the left hand occurred. The paresis gradually disappeared, but the hemianopsia persisted till his death six months after.

Autopsy.—Hydrocephalus. Pia mater opaque and adherent over the right parietal lobe, posterior to the central convolutions, and over the anterior part of the occipital lobe to within 3 cm. of its apex. In this region the cortex was soft, yellowish-gray, and much atrophied. The softening encroached on the cortex of the first temporal convolution inferiorly. The right posterior cornu of the lateral ventricle was distended with serum, and its walls were macerated. The right optic thalamus was softer and flatter than the left. Optic tracts normal. (Stenger, *Arch. f. Psych.*, xiii. p. 247.)

CASE 22. Male, æt. 50, was suddenly attacked with left hemianopsia, there being no other brain symptoms. The field of vision was limited by a vertical line passing through the fixation point of each eye. Central vision good. Ophthalm. exam. negative. Patient died two weeks after of heart disease.

Autopsy.—A large area of softening was found in the right occipital lobe, which extended to the surface on the median side and also to the apex. Optic thalami and tracts normal. (Curschmann, *Centralbl. f. prac. Augenheilk.*, 1878, s. 181.)

CASE 23. Male, æt. 44, noticed on rising one morning a disturbance of vision which was found to be a left hemianopsia. The field of vision was limited by a vertical line passing through the fixation point in both eyes. Central vision and colour sense good. No other brain symptoms. Died several months after, never having recovered his vision.

Autopsy.—An old apoplectic cyst the size of a walnut was found in the right occipital lobe. Its upper wall consisted of the three occipital convolutions which were in a condition of yellow softening. Its inner wall did not reach the lateral ventricle. A small apoplectic cyst was also found in the centre of the right optic thalamus; and a pea-sized spot of red softening in the roof of the anterior cornu of the left lateral ventricle. (Baumgarten, *Centralbl. f. d. med. Wissen.*, 1878, No. 21.)

CASE 24. Male, æt. 42, suffered from left unilateral convulsions without loss of consciousness and temporary left hemiplegia with loss of sense of pain after each convulsion. During the convulsion, patient was aphasic. In June, 1878, left hemianopsia appeared after a convulsion, and continued till his death in

April, 1879. During the last few months there was a slight contracture of the left arm.

Autopsy.—The convolutions posterior to the fissure of Rolando on the right side were atrophied and sunken in, and the white matter beneath was softened. The area of softening included the entire white substance of the occipital lobe and of the superior and inferior parietal convolutions. Thalami optici, corpora striata, and int. capsule intact. Microscopic examination showed the optic tracts to be normal. No other lesion. (Westphal, cited by Wernicke, *loc. cit.*, ii. 195.)

CASE 25. Male. Left hemianopsia not quite reaching the fixation point. Left hemiplegia. Death after three years.

Autopsy.—In the right occipital lobe, posterior to and not involving the optic thalamus, was a large cavity with smooth walls communicating with the inferior cornu of the lateral ventricle. It was found to be the remains of an apoplectic cyst which had destroyed the greater part of the occipital lobe. Corpora amygdacea were found on the surface of the chiasm. Both optic tracts normal. (Hosch, cited by Marchand, *Graefe's Arch. f. Ophth.*, xxviii. 2.)

CASE 26. Male, æt. 40, suffered from headache, dizziness, and drowsiness for nine months after receiving a blow on the head; but not to a degree sufficient to interfere with his profession, which was that of a musician. He was then suddenly seized with severe headache and left hemianopsia. No other brain symptoms developed, but these persisted, and the patient went into a condition of coma, and died in eleven days.

Autopsy.—In the right occipital lobe was found a large abscess one-and-a-half inch in diameter inclosed in a firm wall of connective tissue. It was situated superficially, and caused a bulging of the convex surface of the lobe. It contained pus and granular matter. A second smaller abscess of the size of a hickory-nut was found in the left anterior lobe surrounded by a zone of softened tissue. No other lesion. (Levick, *Amer. Journ. Med. Sci.*, 1866, Oct.)

CASE 27. Prevost reported a case to the Soc. Med. of Geneva, in 1878, in which left hemianopsia was definitely determined. There was found at the autopsy an extensive lesion of the right occipital lobe, and also a lesion of the optic thalamus on its posterior part involving the corpus geniculatum externum. (Cited by Ferrier, *Brain*, ix. 97.¹)

Cases of hemianopsia produced by lesions of one optic tract are so well known and so frequently reported, that it is not necessary to cite them here. The fact that this lesion produces hemianopsia is now admitted by all authorities. For recent cases see Graefe's *Arch. für Ophth.*, xxviii. 2. From an analysis of these cases, the following conclusions regarding the pathology of hemianopsia may be reached:—

Lateral homonymous hemianopsia may be produced not only by a lesion of one optic tract, but also by a lesion situated either in the pulvinar of one optic thalamus;² in the posterior part of one internal capsule or its radiation backward toward the occipital lobe;³ in the medullary portion of the occipital lobe;⁴ or in the cortex of one occipital lobe.⁵ Extensive or multiple lesions⁶ involving two or more of these portions of the brain produce the same symptom. Hence, a lesion in the course of the optic fibres of one side, at any point between the optic chiasm and

¹ The report is very imperfect. I give it as stated by Ferrier, having been unable to obtain the original.

² Cases I. 1, 2, 3.

³ Cases II. 1, 2, 3, 4, 14.

⁴ Cases II. 15, 16.

⁵ Cases II. 5, 6, 7, 18, 19, 20, 21.

⁶ Cases I. 4, 5; II. 8, 9, 10, 11, 12, 13, 22, 23, 24, 25, 26, 27.

their termination in the cortex of the occipital region, produces partial blindness of both eyes. It is, therefore, justifiable to conclude that the occipital lobe of each side is in anatomical and functional relation with both eyes; in such a manner that the like-named sides of both retinae are connected with the like-named hemisphere, *e. g.*, the right sides of both retinae with the right hemisphere, and *vice versa*. When a lesion of one hemisphere involves the optic fibres, at any point, partial blindness of both eyes, and not blindness of the opposite eye, is produced.

These conclusions are forced upon us by a study of these thirty-two cases. They conflict with the statement of Charcot as to the course of the optic nerve-fibres;¹ and with the statement of Ferrier that the angular gyrus is the centre of sight in man, and governs the eye of the opposite side.² These statements must, therefore, be examined.

Charcot's scheme (Fig. 2), in which all the fibres from one eye are

Fig. 2.

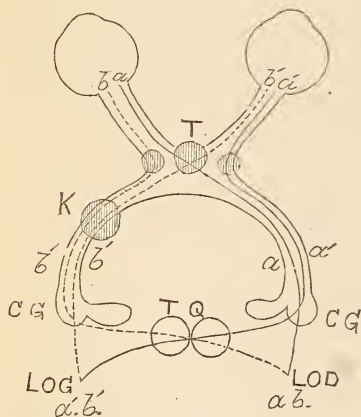


Fig. 3.

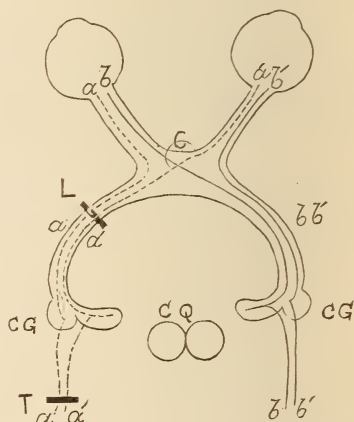


Fig. 2. SCHEME OF THE DECUSSATION OF THE OPTIC TRACTS. (According to Charcot).—T. semi-decussation in the chiasm; T. Q. decussation posterior in the corpora quadrigemina; C. G. corpora geniculata; $\alpha.b.$ fibres which do not decussate in the chiasm; $\alpha'.b.$ fibres which decussate in the chiasm; $\alpha'.b.$ fibres from right eye meeting in left hemisphere, L. O. G.; K. lesion of left optic tract crossing right lateral hemianopsia; L. O. G. lesion of left hemisphere producing right amblyopia.

Fig. 3. DECUSSATION OF OPTIC FIBRES. (According to Graefe and Féré).—C. semidecussation at the chiasm; C. G. corpora geniculata; L. lesion in optic tract; T. lesion in left hemisphere producing right lateral hemianopsia; C. Q. corpora quadrigemina.

seen to meet in the hemisphere of the opposite side, was proposed in order to explain the symptom of crossed amblyopia (*i. e.*, partial blindness in the eye opposite the lesion), observed in cases of hysterical hemianæ-

¹ Charcot, *Le Progrès Medical*, 1875, p. 705. Also *Localisation des Mal. Cerebrales*, pp. 116-127.

² Ferrier, *Localization of Brain Diseases*, pp. 116-120.

thesia. It was not based upon any post-mortem discovery of a lesion in one hemisphere producing the symptom; and Charcot himself stated that it had no anatomical basis.¹ Subsequent examination of the same cases by Landolt revealed the fact that there were visual defects in both eyes instead of in one;² a fact which at once invalidated the accuracy of the scheme. An examination of the figure shows that it is inadequate to explain the course of the optic nerve-fibres if the conclusions here reached are admitted. That Charcot himself believes it to be wrong is shown by his approval of the recent essay of his pupil Féré,³ which proposes to substitute for it the older scheme announced by Graefe in 1860, Fig. 3. The scheme of Charcot is no longer taught in Germany⁴ or in France,⁵ and is given up by its author. It is therefore needless to discuss it.⁶ The symptom which it sought to explain must, however, be examined, as it too stands in opposition to the facts here demonstrated, and forms the basis of a new scheme proposed in February, 1883, by Grasset.⁷ Grasset claims that there are several cases on record in which an autopsy has shown that a lesion of one hemisphere, in the internal capsule, may produce blindness in the opposite eye. He cites four cases, which are as follows:—

1. Right hemiplegia with aphasia and right hemianæsthesia. "The right eye appeared blind; in the left eye the field of vision was much decreased in extent." (Bernhardt, *Berlin klin. Woch.*, 1875, No. 36.)

2. Right hemiplegia and hemianæsthesia. "With the right eye the patient can see only very large letters; left eye normal." (Muller, *Berlin klin. Woch.*, 1878, p. 284.)

3. Right hemianæsthesia and hemichorea. "The visual power is $\frac{1}{3}$ in the left eye, $\frac{1}{4}$ in the right eye. Both visual fields are contracted for white light and for colours, but the right is wider than the left." (Féré, *Hémianopsie*, Paris, 1882, Obs. LXVIII.)

4. Right hemianæsthesia and hemiathetosis. "Diminution in the visual power in the right eye." (Ballet and Féré. Féré, l. c. Obs. LXI.)

It is evident that these cases fail utterly to establish his conclusion. In the first case both eyes were affected, not one alone. In the other three cases blindness was not produced in the opposite eye. The condition was simply a diminution in the degree of visual power; and in one of these three both eyes were affected. The statement of Mauthner made in 1881 may, therefore, be repeated: "There is no case well authenticated in which lesion of one hemisphere has produced blindness in the opposite eye." The scheme of Grasset is thus seen to lack any basis in pathology.

¹ Charcot, loc. cit., page 127.

² Landolt, *La France Médicale*, Feb. 3, 1877. Also cited by Charcot, loc. cit., p. 119.

³ Féré, *l'Hémianopsie*, Paris, 1882.

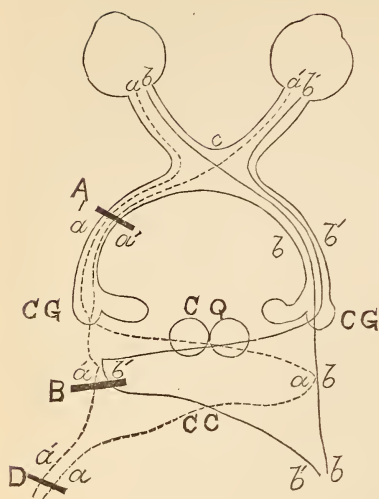
⁴ See Mauthner, *Gehirn und Auge*, 1881. Wien. Wilbrand, *Hemianopsie*, 1881, Berlin.

⁵ See *Archiv. d'Ophthalmologie*, August, 1883, p. 368. Bellouard, *l'Hémianopsie*, Paris, 1881.

⁶ Prof. Ranney, however, seems to regard it as true. See *N. Y. Med. Record*, Aug. 18, 1883.

⁷ Grasset, *Montpellier Medical*, 1883, Feb.

Fig. 4.



DECUSSATION OF OPTIC FIBRES. (According to Grasset)

c, chiasm; *CQ*, corp. quadrigemina; *CC*, corpus callosum; *CG*, corp. geniculata; *A*, lesion in *l.* optic tract, and *D*, lesion in left hemisphere, producing right lateral hemianopia; *B*, lesion in left internal capsule, producing right amblyopia.

First decussation in the chiasm.

Second decussation in the corp. quadrigemina.

Third decussation in the corp. callosum.

It need only be examined to convince one that it is artificial (Fig. 4). The fibres from the two outer halves of both eyes are made to decussate twice; once in the corpora quadrigemina, and once in the corpus callosum. In this scheme a lesion situated in the internal capsule may produce crossed amblyopia, while a lesion in the occipital lobe will produce hemianopsia. It, therefore, explains all possible cases of blindness of cerebral origin, and is adequate to make clear any future cases of crossed amblyopia if such occur. The scheme of Graefe,¹ however (Fig. 3), not only explains all the facts yet established, but is simpler; and in it the course of the optic fibres is seen to be homologous to that of the motor fibres from the parietal region of the cortex to the spinal cord. Both decussate partially, and both bring

each hemisphere into connection with both sides of the body. The scheme of Grasset has no such analogous fact to recommend it. Until new facts are brought forward, the scheme of Graefe is to be preferred therefore (Fig. 3).

It remains to examine the statements of Ferrier. His early experiments on dogs and monkeys led him to deny any functional relation between the occipital lobes and vision. To support this he cited thirteen cases in which lesion of the occipital lobes had not produced blindness.² Eleven of these cases were recorded prior to 1868 when accurate localization of a lesion in the brain was impossible. It is, therefore, not surprising that in a recent paper³ he himself ignores these cases, and admits that subsequent experiments have proved his early statement to be wrong. He now holds that in the angular gyrus and occipital lobes are located the centres of sight. Of the four positive cases cited by him in 1878⁴ to connect the angular gyrus with vision, one was without autopsy, as the

¹ Graefe, *Gazette Hebdomadaire*, 1860, p. 708.

² *Localization of Brain Disease*, 1878, pp. 124-130.

³ *Brain*, Jan. 1881.

⁴ *Localization of Brain Disease*, pp. 130-133.

patient recovered; two occurred in lunatics, and no exact determination of the limits of the field of vision were made; while the original report shows that the angular gyri *alone* were not involved, but the occipital lobes were also affected,¹ and the fourth is quoted from Bastian,² who ascribes the blindness to a lesion of the optic tract and corpora quadrigemina, and *not* to the lesion of the angular gyrus. Of the three positive cases cited in 1881³ not one is accompanied by a record of autopsy. On the other hand, Ferrier himself gives thirteen cases in which lesion of the angular gyrus was not associated with any defect of vision. And Exner⁴ cites twenty-two cases in which sight was not affected. How it is possible under these circumstances to affirm that the angular gyrus has any connection with sight is certainly incomprehensible. The result of physiological investigation on animals can only be accepted as true of man when confirmed by pathological observation. And in a question of this kind cases in man are perfectly worthless unless accompanied by a record of an autopsy, for it is only by a rigid comparison of ascertained limited lesions with symptoms that any conclusion can be reached. As Ferrier does not cite any such cases his conclusions must fall for lack of proof. The discovery of Wernicke, that a direct tract passes from the optic thalamus to the occipital lobe just beneath the angular gyrus, may explain the results of Ferrier. For a lesion of the angular gyrus, unless superficial, would probably involve this direct tract and thus produce a disturbance of vision.

The statement based upon the study of the thirty-two cases here cited is, therefore, strengthened by the fact that opposing conclusions will not bear a strict examination. The visual area lies in the occipital lobes. It is not yet possible to connect definite areas of the cortex of one occipital lobe with definite areas of the retina, as Munk was able to do in the case of dogs and monkeys. Hemianopsia is produced in man whether the lesion lie on the convexity or on the median surface of the lobe.⁵

Any form of brain lesion, abscess, embolic softening, hemorrhage, tumours, chronic meningitis, if located in the course of the optic fibres or on the surface of one occipital lobe, may produce hemianopsia. The symptom is not due, therefore, to the shock of an apoplexy or embolism; nor to an increase of intracranial pressure; as cases occur in which neither of these conditions are present. It must, therefore, be regarded as a symptom indicating a local circumscribed lesion of one hemisphere, and not a general symptom (such as headache or coma) of brain-disease.

Before proceeding to consider the possibility of making a diagnosis of

¹ Fürstner, Arch. f. Psychiatrie, viii. and ix.

² Bastian, Paralysis from Brain Diseases, pp. 113.

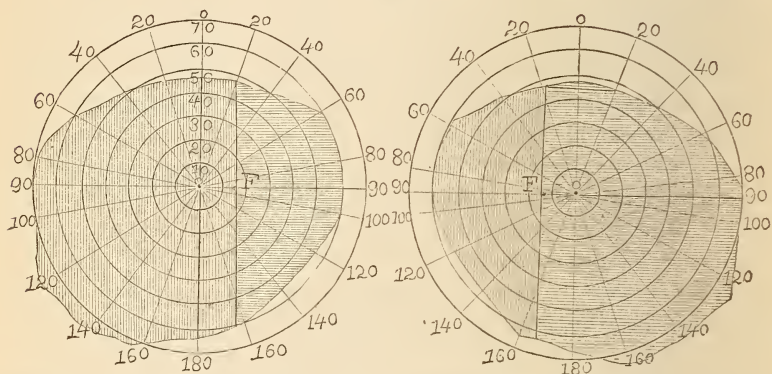
³ Brain, Jan. 1881.

⁴ Localization d. Gehirnk.

⁵ Compare Cases II. 6, 18, with Cases II. 17, 19.

the location of the lesion in any given case it will be necessary to analyze the symptoms recorded in the cases here cited.

First. As to the symptom of hemianopsia it will be noted that in the majority of cases the hemianopsia was limited by a vertical line passing through the point of fixation. If the visual fields of the two eyes are compared in the figure it will be seen that the defect in the eye of the side opposite the lesion is much greater in extent than in the eye of the same side.

Fig. 5.¹

VISUAL FIELD OF LEFT EYE. (After Förster). VISUAL FIELD OF RIGHT EYE. (After Förster.)
F = Fixation-point; macula lutea. *O* = Entrance of optic nerve; the blind spot.
 The vertical lines represent the defect of vision in left lateral hemianopsia. The horizontal lines represent the defects of vision in right hemianopsia.

In right hemianopsia the right eye, and in left hemianopsia the left eye is most affected. It is, therefore, not to be wondered at that in cases of hemianopsia the patient rarely if ever notices the exact character of the symptom, and usually complains only of disturbance of vision in the eye most affected. It was by careful examination only that the nature of the disturbance was ascertained in the majority of the cases here cited. This fact is of great importance, for it follows that many cases of hemianopsia may escape detection, and that many cases of so-called crossed amblyopia might, if properly examined, prove to be hemianopsia. In proof of this I may refer to a number of cases² in which the lesion found was one which should have produced hemianopsia, but in which the report simply states that there was a disturbance of vision without describing its limit or character. Greater care in the examination of cases, and an exact determination of the visual field are necessary.

In all the cases reported here central vision was preserved. This was

¹ The visual field is of course the reverse of the retinal area.

² Boston Med. and Surg. Journ., vol. lxii. p. 356; vol. lxxii. p. 100; vol. lxxxiv. p. 252; Archives of Medicine, Aug. 1882, p. 64; Brit. Med. Journ., Feb. 6, 1876.

to be presupposed as only one-half of the macula lutea was affected. It agrees with the theoretical statement of Mauthner.¹

In all cases, except those in which the nature of the lesion produced an increase of intracranial pressure, the ophthalmoscopic examination was negative.

It may, therefore, be stated that if in any case of hemianopsia the limit of vision passes beyond the fixation point, or if there is a diminution in the power of central vision, or if the visual field is diminished in extent in its entire periphery, there must be some condition present in addition to the local lesion which causes the hemianopsia and not referable to it. Such conditions are to be explained by a defective state of the eye existing prior to the hemianopsia, by an increased intracranial pressure, by a descending optic neuritis, or by some other cause. They are not symptoms of a local lesion. Mauthner states that colour-blindness in the unaffected halves of the eye never accompanies hemianopsia and one case cited here supports this statement. In the other cases no record of colour tests was given.

In eight cases here cited,² hemianopsia was the only permanent brain symptom present. In one of these the lesion was in the optic thalamus. In two it was in the occipital lobe, but involved the thalamus. In the remainder it was confined to the occipital lobe. These cases alone would prove the fact that the visual area of the brain is located in the occipital lobes; for the thalamus is to be considered only as a ganglion interposed in the course of the fibres to the cortex, and not as the seat of conscious perceptions of sight. Consciousness is associated with cortical activity only. Visual impressions received by the eye and sent inward as impulses to the brain are, therefore, perceived consciously only when they reach the cortex of the occipital lobes. In order to their perception the tracts to the cortex, and the cortex itself, must be intact. Destruction of other parts of the brain can be shown to have no effect upon vision if this region is uninjured. Hence the conclusion is inevitable that the visual area lies in the occipital region.

Secondly, as to the other symptoms. In thirteen of the cases here cited, permanent hemiplegia accompanied hemianopsia.³ In all these cases except two,⁴ this symptom finds its explanation in a lesion either of the motor tract between the cortex of the parietal region and the crus cerebri, or of the corpus striatum. In some cases one lesion was of sufficient extent to involve both the motor and the visual tracts, where they cross in the internal capsule. In the others the hemiplegia was due to an extension of the lesion from the occipital to the parietal cortex; or to a second lesion

¹ Mauthner, *Vorträge aus der gesamt Gebiet der Augenheilkunde*, vol. i. p. 360.

² Cases I. 1; II. 7, 18, 19, 22, 23, 26, 27.

³ I. 2, 3, 4, 5; II. 1, 2, 4, 11, 14, 15, 17, 24, 25.

⁴ I. 2; II. 25.

in the motor area. We have, therefore, no reason for referring the paralysis to the lesion of the occipital lobe.

The same statement applies to those cases, eight in number, in which hemianæsthesia was a permanent symptom.¹ In these cases a lesion in the optic thalamus, or in the posterior part of the internal capsule, or pressing upon these two parts was the cause of the symptom. The course of the sensory fibres in the brain above the level of the internal capsule is still unknown. The twenty cases of lesion of the occipital lobe without hemianæsthesia, however, furnish the important fact that the areas of common sensation do not lie in that part of the brain.

Aphasia, which was associated with right hemianopsia in ten cases,² was either due to an independent lesion involving the speech centre about the left Sylvian fissure, or to pressure upon the island of Reil by tumours, abscesses, or clots in the centrum ovale or the basal ganglia. It is conceivable that a tumour on the base of the brain might press upward into the Sylvian fissure, and inward upon the optic tract and thus in still a third manner produce this association of symptoms. The aphasia cannot, however, be referred to the lesion in the occipital region.

In the cases in which monoplegia occurred³ there was always found a lesion of the central convolutions in the parietal region, and the unilateral convulsions or monospasms indicated even during life the seat of the lesion.

It is, therefore, evident that the symptoms other than visual cannot be referred to the lesion of the occipital lobes; and further that the visual symptoms cannot be referred to any lesion excepting to that of the occipital lobe. Therefore the visual area must lie in the occipital lobes.

With these facts in view the question arises, are there any means of locating the lesion present in a case of hemianopsia? Reference is here made to lateral homonymous hemianopsia. All other forms are due to a lesion of the optic chiasm or optic nerve. A review of the cases and a comparison of symptoms with lesions will demonstrate that this is impossible. The lesion producing the hemianopsia may lie at any point in the course of the optic fibres from the chiasm to the occipital cortex, and in all cases the character of the hemianopsia may be the same.⁴ It is only from a study of the accompanying symptoms, therefore, that the lesion can be located. But each of the other symptoms may be due to lesions situated at various points. If it can be proven from a study of the other symptoms that the lesion must be in one definite position, and at the same time a lesion in that position would intercept the visual tract, a probable

¹ I. 2, 3, 4; II. 2, 4, 11, 13, 15.

² I. 3, 4, 5; II. 1, 2, 3, 5, 9, 13, 14.

³ Cases II. 6, 10, 13, 20.

⁴ Ferrier's statement that in hemianopsia of cerebral, as distinguished from optic tract lesion, central vision is retained for several degrees on all sides of the point of fixation, is not supported by these cases.

diagnosis may be reached. For example: if a hemianopsia were associated with hemiplegia and hemianæsthesia of the like-named side, the lesion would probably lie in the internal capsule near the pulvinar of the optic thalamus where the visual and sensory-motor tracts intersect. Or if the hemianopsia were associated with paralysis of some of the cranial nerves to the ocular muscles, with loss of smell, or with anæsthesia of the face, the lesion would probably lie on the base of the brain and be producing destruction of the optic tract. In the latter case an atrophy of the optic nerves would follow in the course of time, and would be most noticeable in the eye opposite the lesion. Aside from these cases it would be impossible to locate the lesion, especially if it were one which gave rise to an increase of intracranial pressure. A number of diagnostic points proposed by Ferrier, by Wilbrand, and by Bellouard, when applied to the cases here cited were found to be worthless, and hence are not stated. The opinion expressed by Mauthner that there are no means of locating the lesion definitely must still be accepted.

The frequency of hemianopsia occurring with hemiplegia must not be estimated by the limited number of cases here cited. There are over two hundred cases recorded in the journals published during the past four years, but only those here given were accompanied by an autopsy. The affection is certainly more common than has been supposed, and as it frequently escapes the patient's notice, should always be sought for when a case of hemiplegia is examined. By careful examination of such cases it is probable that more accurate means of diagnosis may be discovered.

The limits of this article will not permit a discussion of the numerous cases on record in which inflammatory processes located in the visual area have given rise to visual hallucinations; or in which partial destruction of the cortex of the occipital lobes has produced a loss of memory of objects recognized by sight—the interesting condition of psychical blindness, as distinguished from and not associated with actual blindness—or in which total destruction of both occipital lobes has been accompanied by actual blindness of both eyes. These facts unite in supporting the conclusion which has been reached in this article from the study of hemianopsia.

It is evident from a consideration of the facts here stated that anatomical research, physiological experiment, and pathological observation unite in assigning to the occipital lobes of the brain the function of sight. The right occipital lobe receives impressions from the right half of both eyes, and the left occipital lobe receives impressions from the left half of both eyes. The visual area of the brain lies in the occipital lobes.

ARTICLE IV.

TRISMUS NASCENTIUM, OR THE LOCKJAW OF INFANTS: ITS HISTORY, CAUSE, PREVENTION, AND CURE. ILLUSTRATED BY CASES AND POST-MORTEM EXAMINATIONS, WITH STATISTICAL TABLE OF 229 DEATHS. By J. F. HARTIGAN, M.D., of Washington, D. C.

DURING the winter of 1877 a discussion arose in the Board of Health of Washington, caused by the continued reports of a large number of cases of this disease by the Medical Sanitary Inspector, Dr. W. D. Stewart, and some of the members expressed decided incredulity in the diagnosis. A committee was appointed to investigate the subject, and in six weeks sixteen cases were observed, two being seen before death. The symptoms presented were so characteristic and uniform as to leave but little doubt of their nature. Three post-mortem examinations, performed by Dr. Triplett, afforded further verification in their anatomical lesions. Thus it may be admitted that there was very good evidence of the correctness of Dr. Stewart's diagnoses. The committee, however, did not agree, either as to the identity of the disease, or its etiology.

About the time mentioned, several of these cases came under my observation, with the curiously uniform post-mortem appearances of congestion of the brain or spine (more commonly the latter), or both, with extravasation, and there was no other lesion observed internally, except engorgement of the lungs. These facts impressed me with the importance of determining, if possible, the nature of a disease so fatal within the first month of infantile existence. The Act of Congress a few months later, abolishing the Board of Health and substituting therefor a Health Officer, afforded me the invaluable assistance of Dr. D. C. Patterson, Coroner of the District, without whose counsel and co-operation in the investigation of these cases the results herein set forth could not have been obtained.

Deaths being continually reported with the train of symptoms of this disease, I made many post-mortems without keeping a record—the results showing only a marked and painful sameness throughout. It certainly seemed to require violence, or some mechanical cause, to produce such grave lesions in infants generally well developed, and otherwise healthy. As post-mortems multiplied, perplexity increased, and stimulated desire to ascertain the cause. Text-books were consulted, but most writers treated the subject unsatisfactorily, ascribing every conceivable condition for its development.

The extravasation mentioned, observed in the posterior part of brain and spine, and the relative situation of the bones externally, now attracted attention. It was found that there was usually a depression of the occipital, or that one side was overlapped by the parietal bone. Here then was rational ground for the process of deduction, or induction. Did these

appearances demonstrate cause and effect? viz., mechanical pressure of the occipital or parietal bones on the brain, through the intervening dura mater, finally expending its force on the pons, medulla oblongata, and the nerves issuing therefrom—a theory which I soon found had been advanced over thirty years before by Dr. J. Marion Sims, then of Alabama. Time has not changed the views of this distinguished gynecologist, as I learn from a letter recently received from him, and I believe they will stand pre-eminent in the history of his great achievements, and their truth it will be my endeavour now to establish, with some additional facts.

There is no latitude free from the ravages of this disease. It stands first in the long catalogue of fatal maladies; its advent is sudden and unexpected; life promising well is destroyed in a few hours, turning the joy of parents into sorrow, and blasting their well-grounded hopes. So well known is its fatality among midwives, especially the coloured grannies, that it is common to hear them say, “No use to send for the doctor; babies with nine-day fits die sure.”

Hippocrates, Aristotle, Celsus, and Aretæus describe the disease. In the works of Galen it is first named trismus. Moschion and Levret, who figured in the first century, entertained an opinion in regard to its exciting cause—that the stagnant blood in the umbilical cord might produce dangerous disease, in which M. Bajou concurred.

All nosological writers have called this species of trismus, tetanus; which Cullen describes as a spastic rigidity of the inferior maxilla, attacking infants between the second and seventh day from birth, and as confined more especially to cold regions.

Clarke, Chrisholm, and Hilary teach, that in the West Indies it prevails in the worst form. It is called there, and in South America, seven days' disease. Hofer (*Acta Helvetica*, vol. i.) testifies that it is present in the Helvetian mountains in Switzerland. According to Dr. P. C. Gailard, “it occurs among the children of the poor in Russia, Germany, Scotland, and Iceland.” In the middle of Germany it occurs oftener than any part of Europe, especially in districts where there is no parochial church, thus obliging the mothers to make long journeys to have their infants baptized. It is also common in some of the northern parts, where the infant is swaddled, arms tied by the side, and fastened to a board, being left to lie in this position often for hours at a time, on the back. M. Fourcroy, who wrote a treatise on the subject in 1744, says, that twenty-four per cent. of children born in St. Domingo die of this disease. According to Dr. John Hancock, in Essequibo, Demerara, and neighbouring islands, the disease kills half of the whole number of infants born, and the mortality is at least ninety-nine in a hundred. Mr. Morrison, who practised for several years at Demerara, and Mr. O'Brien never knew one authenticated case of recovery. Dr. Hüpeden says: “In certain colonies of Guayanas, half the children born die of trismus.” On the West Man-

neyer Islands, south coast of Iceland, according to McKenzie, the small number of inhabitants are only kept up by emigration, the disease is so prevalent, carrying off all the new-born. It is referred to in Cleghorn's treatise *On the Diseases of Minorca*, as being very fatal; and Dr. Maxwell says, in the *Jamaica Physical Journal*, "The depopulating influence of trismus nascentium was not less than twenty-five per cent.; it scarcely has a parallel within the bills of mortality."

Dr. S. B. Labatt, in a letter to Dr. Collins, says: "During ten and a half years that I was resident in the Lying-in Hospital, Dublin, I witnessed nearly two hundred cases, and after giving a fair trial to all remedies of repute, in no case when the disease was fully formed did I meet with a recovery." Dr. Evory Kennedy, during his mastership of the hospital, gives similar testimony; and Dr. Collins says of the results of his treatment: "In every instance I have been disappointed."

G. Gaynard believes that the disease is most common in warm countries, and children of negroes seem more predisposed to it. In Africa, on the contrary, the white children are oftener attacked during rainy seasons. He agrees with Matuszynski, and others, who hold that paralysis and death occur only when congestion is replaced by effusion. The most frequent cause is cold, and sudden changes of temperature; he thinks inflammation of the umbilicus can only be a very rare cause.

Dr. Nailer, of Mississippi, declares that about two-thirds of the deaths amongst negro children are from this disease, and so uniformly is it fatal that a physician is never sent for. According to Drs. J. H. Pooley, W. B. Fletcher, J. S. Bailey, Baldwin, Collins, Thomas C. Black, Rush, Fourcroy, Valentine, Von Busch, Goelis, Ducille, Campet, Wooten, G. T. Maxwell, Bierbaun, and John M. Watson, of Nashville, the disease runs its course, in spite of treatment, to a fatal issue. Dr. H. C. Bryson thinks that climate or season exerts but little influence in its production.

S. L. Grier, M.D., of Mississippi, *On the Negro and his Diseases*, affirms that trismus decimates the African race upon our plantations within the first week of independent existence. He has known more than one instance in which of the births for one year one-half became the victims of this disease.

Dr. W. L. Sutton, referring to its great fatality, remarks: "This is strikingly the case in the West Indies and in our Southern States, where some families are awfully scourged, whilst their neighbours almost or entirely escape."

Dr. Meriwether, of Alabama, writes: "It generally appears sporadically, rarely attacking white children, which is to be accounted for by the superior cleanliness of the white race." As opposed to this view, the Editor of the *New Orleans Med. and Surg. Journ.*, vol. ii., 1846-7, remarks that the affection is by no means confined to coloured children in that city, but is occasionally met with in the most respectable white

families. This statement is confirmed by the annual report for 1882, which shows the mortality to be 172 (not including 106 cases reported as infantile convulsions), of which number 90 are white. Similar reports come from other Southern cities.

Dr. A. Vogel saw the disease under all conditions of the weather, and did not believe meteorological considerations had anything to do with it. He made two post mortems without finding any navel lesion. Dr. Collins says: "We have never been able to discover any peculiar morbid appearances which would justify us in offering any explanation of its pathology." Romberg, Olliver, and Prof. Doherty, consider that it results from inflammation and ulceration of the umbilical vessels. Dr. E. Hughes suggests vaginal disease among the causes. Joseph Frank gives chilling of the body in any manner as a cause, while Duges mentions this as the sole agent in its production. Bajou, who has had a large experience at Cayenne, attributes it to cold and sea air, as it is unknown in the interior; Dr. Evans to costiveness. Underwood seriously remarks: "The cause has at length been clearly ascertained, and happily its prevention, by Dr. James Clark, who, perceiving that those houses were free from the disease in which there were no fires, very soon demonstrated it to be owing to the smoke from the burning wood; the negro houses having no chimneys to carry it off."

A few words with regard to filth, bad ventilation, and hygienic surroundings. Dr. P. C. Gaillard, after quoting crowded localities, bad or insufficient nourishment, etc., says:—

"But these do not act with more energy in this than in any other disease, and in fact seem to exert no peculiar influence whatever; for the disease is not observed to be most common in the localities where these conditions most especially obtain, as for instance, in the manufacturing and mining districts of England and Ireland, and in large cities everywhere. Indeed, I have seen it under every circumstance; in the well-kept elevated and isolated spot in the country, as well as the crowded, filthy, and lowly situated city hovel."

Dr. J. S. Bailey (*Med. Record*, vol. v., 1870), in reporting three fatal cases, says: "Vitiating atmosphere and want of cleanliness did not produce the disease, for the apartments were cleanly and well ventilated."

Dr. Ingham (*Amer. Journ. Obst.*, vol. viii., 1875) alluding to a local epidemic of trismus on a Southern plantation gives similar testimony.

To show the relative frequency of the disease in the Lying-in Hospital of Copenhagen, and the affiliated houses scattered in different parts of that city, Dr. Stadfeldt says there were 11 deaths in 10,000 children born in the former, whilst in the latter there were 82 in about the same number of births. "The danger of trismus occurring is therefore greater in the affiliated houses, although the hygienic conditions are better."

Dr. Harrison said (*New Orleans Med. and Surg. Journ.*, May, 1846): "We find it scarcely existing on the main land of Iceland, but in the island of Heimacy, adjacent, such has been its fatality that not a child

has been raised there. These are highly valuable historic facts, which forbid the idea of its having any connection with umbilical injury."

In the *Annales Méd. de la Flandre Occidentale*, 1857, Contenot observes: "Since Bajou wrote on the subject, two-thirds of the infant slaves in Cayenne died in the first days of their existence; M. Boireau also refers to it being frequent and fatal in the French Antilles, and that inflammation of umbilicus is always present. Those attacked at Cayenne before the ninth day are abandoned or left to die." In a case of recovery, reported by him, the umbilicus was healthy. The anatomical lesions he calls an apoplexy of the spinal centre, which is only a terminal consequence of the tetanic disease, and he thinks the case related would have been incurable from the instant a hemorrhagic condition would be realized. After discussing the various causes, he is inclined to the cold theory.

Dr. Thore (*Archiv. Gén. de Méd.*, vol. viii., 1845) gives an account of an autopsy as follows: "A bed of bloody fluid and coagula lined entire extent of spinal canal, outside the dura mater; no trace in spinal arachnoid. Nothing abnormal in brain or membranes; congestion posteriorly of lungs." West says: "The most frequent post-mortem appearance consists of effusion of blood into the cellular tissue surrounding the theca of the cord." "Dr. Goelis, of Vienna, frequently found an appearance of *increased vascularity* in the substance of, and in the membranes enveloping, the upper part of the spinal marrow. The same has been observed by Dr. Thompson, of Philadelphia." (Curling, p. 109.) M. Billard (Stewart's ed., p. 490), after remarking that he had only witnessed two instances of the disease, both of which proved fatal, observes he "found on dissection, *nothing more than an effusion of a quantity of coagulated blood in the spine*." Bouchet, Continot, Matuszynski, Gaynard, and Barillier say that the congestion and hemorrhage found in dissections are an effect, not the cause of the disease.

In a post-mortem examination in the practice of Dr. Baldwin, he "found the umbilicus enlarged, hardened, and a portion of the surface, to which the cord was attached, dry and red. Membranes and substance of the brain natural. *A thick and very firm coagulum found covering the posterior and lateral surfaces of the medulla spinalis*, extending the whole length of the spinal column. Other organs normal." Bednar saw no constant lesion of the navel in the cases he observed.

Dr. Hester, of New Orleans, says: "It seems to be produced by the action of an unhealthy atmosphere upon extremely delicate and nervous systems." Sir Charles Bell remarks: "In the West Indies it is produced from exposure to the night air, and most probably from exhalation from the ground."

Dr. Joseph Clarke (*Trans. Royal Irish Academy*, 1789) says that up to the end of 1782, of 17,650 infants born in his institution, 2944 died within the first two weeks, or nearly every sixth child, 19 out of every 20 being

from nine-day fits. As the disease had hitherto yielded to no remedy, he directed his attention to its prevention rather than cure. In the old hospital, which preceded the one he refers to, and in a less airy part of Dublin, of 3746 births, only 241 died within the first month, or 1 to 15½. During a period of five or six years in the British Lying-in Hospital, of 3611 born, 146 died, or 1 to 25; while in the London Lying-in, he was positively assured that the death of an infant was a rare occurrence; from which he thought the uncommon mortality of children in the Dublin Lying-in Hospital satisfactorily proved, and therefore ventured to "hazard the following conjectures on the causes of mortality, viz., foul air, uncleanness, irregularity in the manner of living of their mothers, more especially in the abuse of spirituous liquors." In adopting his mode of ventilation, he also reduced the number of beds in the wards, with the most favourable results. Of 8033 children subsequently born, only 419 died in the hospital, or 1 in about 19½.

Dr. M. Bartram, of S. C. (*Trans. Coll. Phys. Phila.*, 1793), was the first to ascribe the disease to the umbilicus, a theory, as has been seen, vaguely referred to by Moschion and Levret 1700 years before. He said it was uniformly fatal among the infant negroes; neglect to bandage the abdomen allowed the umbilicus to become distended and puffed out, this evil being augmented by the friction of coarse cloths and the worst of dressings. "For the most part, it makes its attack with the dropping of the cord, though rarely it occurs several days after it is entirely healed; this is not surprising, when it is compared with several instances upon record of tetanus in adults taking place long after the wound is cicatrized."

A. Colles, M.D. (*Dublin Hosp. Reports*, vol. i., 1818), agrees with Dr. Bartram, and made about 25 dissections, with the following results:—

"The skin forming the edges of umbilical fossa was in some a little raised; on expanding with forceps the floor of this cavity was in the centre raised knob shape. A probe readily passed through it, entering the umbilical vein, the peritoneum covering which was highly vascular sometimes up to the fissure of the liver. The peritoneum covering the arteries was still more inflamed, and extended often up to the bladder. The vein, on being cut open, contained only a few small coagula; its inner surface was pale and free from inflammation, although the coats were much thickened. The arteries contained a thick yellow fluid like lymph, and their coats were thick and hard also. The peritoneal surface of umbilicus showed a soft yellow substance in the centre, resembling coagulable lymph, which formed the prominence mentioned in the external vein, the arteries generally opening into it."

S. B. Labatt, M.D., Master of the Lying-in Hospital, Dublin (*Edin. Med. and Surg. Journ.*, vol. xv., 1819), in reply to Dr. Colles, gives an account of nine dissections, showing that the appearances mentioned are not always present in trismus, and are sometimes found in other diseases.

Dr. John Hancock says (*Edin. Med. and Surg. Journ.*, vol. xxxv., 1831): "The chief and essential cause of trismus is an irritative impression made on the nervous system by the compression of the cord in tying it."

Dr. Chas. Woodworth, of Miss. (*Boston Med. and Surg. Journ.*, vol. v., 1832), reports a fatal case which he thought was produced by irritation in the intestinal canal.

Dr. Von Busch (*Neue Zeitsch. für Geburts.*, vol. v., 1837) says that the disease, according to his experience, always occurs after the cord has dropped off, and not later than the tenth day after birth. In no case had he found suppuration or inflammation externally, and in his new observations of arterial inflammations, the same was seated far distant from the navel. Diffuse peritonitis was found apparently originating at the posterior wall of the bladder. The arteries showed bulbous swellings, the thickness of a goose-quill, and half an inch long. A dense deposit of fibrin, in a sheath-like form, was found between the outer and middle coats, and in the lumen black-looking thrombi. A sound could be introduced from the navel through the arteries up to the swelling. Below they were open to their continuation in the hypogastric. Nothing abnormal about the umbilical vein, but a sound was introduced its whole length also. From his observations, he believes the disease, in most cases, due to this inflammation of the umbilical arteries, possibly produced by the entrance of air.

Dr. C. E. Levy, of Copenhagen (*Neue Zeits. f. Geburt.*, vol. vii., 1839), agrees with Von Busch that inflammation of the umbilical arteries is the cause of the disease. In five of six autopsies which he made, there was also hyperæmia of the brain. In three, extravasation outside the spinal dura mater. In one, unusual injection of arachnoid spinalis. He adds that the spinal extravasation was a post-mortem accident, and attaches less importance to hyperæmia as a cause of the disease.

J. Matuszynski (*Gaz. Méd.*, Paris, vol. v., 1837) gives the result of twenty autopsies, made with the greatest care, by Dr. Finckh as follows:—

"The bodies were covered with linen, wet with vinegar and laid on the belly, so as to prevent infiltration of blood in dependent parts. Most were made thirty-six hours after death, some four to six hours. Around the umbilicus was generally perceived areola of bluish-green colour. In sixteen cases of spine examination, there was abundant effusion of black blood all along the canal, in the space between the dura mater and the canal; sometimes it was limited to cervical or dorsal regions, sometimes extravasation of serum, irregular in location. The dura mater and arachnoid were generally healthy; pia mater almost constantly injected, sometimes thickened. The cord was reddened twice, once was softened, once appeared indurated. All the rest of cases normal. Exudation of blood in cranium, preferably in subarachnoid tissue or ventricles; in one case lymph was found, sometimes serum in ventricles. The brain in two cases was firmer than usual, in others softened. Nothing worthy of note in abdomen or chest. Umbilical vein and arteries were scrupulously examined, and presented no sensible alteration."

Dr. Schneemann says (*Hann. Ann. für die ges. Heilk.*, vol. v., 1840), "That want of oxidation of the blood has much to do with producing it;

and this is favoured by too rapid tying of the pulsating cord, or by placing the child under the bedclothes, and half suffocating it with the foul odours between the sheets of a puerperal woman."

Prof. P. G. Cederschjöld (*Neue Zeitsch. für Geb.*, vol. x., 1841) states, that 42 children treated in the general lying-in house at Stockholm, in 1834, were seized within five months, 34 of whom died. In order to discover its origin, certain meteorological observations were made. After describing them, Prof. Cederschjöld remarks:—

"It appears very probable that the unusually long-continued bad weather mentioned caused not only the many cases of the disease, but created an epidemic which continued long after these atmospheric causes had ceased to exist. It is strange that the disease, as far as I know, did not show itself during this time in the dwellings of the city, or elsewhere, except in the lying-in house.¹

"Post-mortems showed congestion of vessels, sinuses, and membranes of brain; the distension greatest at the base with extravasation. Spinal cord showed a like condition. The heart and its great vessels were congested; lungs also, and generally collapsed. Liver occasionally congested. Of all in whom the disease was fully developed, not one was saved. Those reported as cured only showed the prodromes, and as these are not at all positive, it is possible that many of these children would not have had the disease at all."

In the *New Orleans Med. and Surg. Journ.*, vol. ii., 1845-6, Dr. Wooten remarks: "I have usually observed the first symptoms to make their appearance about the time the umbilical cord comes away, and from this I at first supposed that it was the effect of awkwardness in dressing the navel by the ignorant midwives who usually attend on the plantations, but careful investigation led to nothing conclusive on this point." In the same number the editor invites communications on the subject, because of the alarming mortality at that period, numbering one hundred and fifty annually in New Orleans.

Such has been the history of this disease, and the various causes given by those who perhaps devoted most attention to it. The suggestion in the article just preceding evidently met the eye of Dr. Sims at the time. At all events, in the same year his first paper appeared in the *American Journal of the Medical Sciences*, giving his interesting views. In the subsequent one, in 1848, after further experience and investigation, he made clearer those views, modifying some of his first propositions. Before discussing them in connection with my own facts and cases, I shall proceed to review much of what has since been written on the subject, referring also to the claimed analogy to tetanus in the adult.

Dr. Baldwin, of Alabama (*Amer. Journ. Med. Sci.*, N. S., vol. xii., 1846), sustains its identity with tetanus in the adult, believing it to be *generally*, if not always, traumatic, and locating its exciting cause in the

¹ Dr. Busch, who translates the article, here makes the following note: "This circumstance appears to me to speak against the assumption of the author that weather changes produced the disease, and it may be assumed that local causes, or harmful influences existing in the institution, had probably more to do with its appearance."

umbilicus. He recites other agencies in producing the disease among negro children, such as want of attention and proper preparation on the part of the mother, illy constructed houses and surroundings, mode of dressing of umbilicus, filth, with a predisposing condition of the atmosphere. With regard to the pathology of the disease and tetanus in the adult, he thinks "the reflex function of the 'excito-motory' nerves," as demonstrated by Marshall Hall, is a clear solution of the phenomena observed. Dr. N. Meriwether, of Alabama (*Amer. Journ. Med. Sci.*, vol. xxvii., 1854), believes the disease is caused by absorption of pus by the umbilical vessels. Dr. D. P. Calhoun, of Louisiana, and others, write that they have had frequent opportunities to test the practice recommended by Dr. Sims, and found it highly successful. Dr. John M. Watson refers in a sarcastic vein to Dr. Sims's explanation, and holds with much positiveness that the umbilicus is, with few exceptions, the constant exciting cause of the disease.

Dr. W. L. Sutton (*Nashville Med. Journ.*, vol. iv., 1853) thinks the relation that displacement bears to trismus may be considered as *sub judice*.

"A point made by both Baldwin and Watson is the similarity of time in the period of incubation. I think they have been a little hasty in their assumption; the best criterion is the test of truth. Curling has given a table of 124 cases of tetanus in the adult with the time from the reception of the injury to the appearance of the disease; and a table of 185 children dying of trismus, and the number of days they lived. Collins also has given 34 cases of trismus with the day on which each was attacked—also the duration of the disease in 30. Of the 124 deaths the disease appeared in 90 after the *seventh* day; whilst of the 185 children 131 died on and before the *seventh* day. Again, of the 124 by Curling, 70 were attacked after the *ninth* day. Of the 185 children, 165 died on or before the *ninth* day. But of the 30 cases given by Collins in which the duration of the disease is stated, the average was 31.7 hours. Subtract this from the time lived by Curling's infants, and we have about 155 attacks on or before the *seventh* day, or 84 per cent., whilst of 124 adults, 54, or 43.5 per cent., were attacked on or before the *seventh* day. But even this falls short of the proper view, for if we take Dr. B.'s standard and adopt the separation of the cord as the time at which the injury is received, then assuming four days from birth as the time of separation, all of Collins's cases will fall *short of seven* days and 175 of the 185 of Curling's. Again in Collins's cases and in Curling's the disease occurred on an average two days after the average time for the separation of the navel, whilst in the 124 adults by Curling the average time at which the disease supervened was 11.67 days. I think, therefore, the facts do not bear out the conclusions of Drs. Baldwin and Watson."

"It is worthy of remark," Sutton concludes, "that Prof. Harrison, of New Orleans, detected the displacement of the occipital bone and attempted its restoration fifteen months before the publication of Dr. Sims's first paper."

On page 203 of the same volume, Dr. Sutton details a case that came under his notice since writing the foregoing. His conclusions are that the child was born trisimal, that the disease was brought on by pressure from the occipital bone.

Mr. J. Harrison, F.R.C.S. (*Brit. Med. Journ.* i., 1860), agrees with Dr. Colles, but does not claim that trismus is the only disease that may arise

from a festering navel, as is shown in the following, which he saw on the sixth day: "The child had a grievous look—sunken—clearly from grave mischief; the umbilicus was festering, abdomen distended and hard. It died on the eighth day. At the post-mortem the umbilicus was red and prominent; there was universal peritonitis, and the liver was wholly covered by false membrane. In this case there were no symptoms of trismus."

Dr. Hervieux (*Gaz. des Hôp.*, 1862) says that meningeal apoplexy of the spinal cord is the nearly constant lesion, and the most probable cause is cold. No disease of umbilicus or of any of the organs was observed in the two cases he reports.

M. Le Barillier (*Journ. de Méd. de Bordeaux*, May, 1863) recognizes eclampsia as different from trismus, and neither like tetanus of the adult. In a case of trismus that he details, the autopsy showed no trace of inflammation of the umbilical cord. The condition of the brain and spine accorded with appearances described by Thore and Hervieux.

Dr. G. Dowell (*Amer. Journ. Med. Sci.*, vol. xlv., 1863) thinks that the primary cause of the disease is in the umbilicus, brought on by congestion of the liver from coagulation of blood in the umbilical vein, having several times found such changes in post-mortem examinations. He ascribes among the many causes a hereditary tendency.

Dr. J. Lewis Smith mentions uncleanness and impure air among the chief factors in the causes. The ten cases observed by him were all in shanties where habits of cleanliness were impossible, and he never saw or heard of a case in the better class of domiciles.

"According to Romberg, Dr. Scholler found inflammation of the umbilical arteries in 15 out of 18 autopsies. Dr. Finckle made careful examination of the umbilical vessels in 11 cases, without discovering any pathological change."

"In the *Edinburgh Med. and Surg. Journ.*, Jan. 1822, Dr. James Thomson, who spent considerable time in the tropics, examined nearly 40 infants, and found the navel in all states. "In the *Dublin Journ. of Med. and Chem. Sci.*, Jan. 1836, Dr. John Breen remarks: "In my own experience there was no evidence of disease in the umbilicus.'"

From such statistics as the foregoing Smith says that while umbilical disease is a frequent cause of tetanus nascentium, yet cases occur in which we must look for some other. He thinks that, if Dr. Sims's mode of explanation was correct, it would ordinarily occur sooner; compression of the medulla would certainly be followed by immediate and marked symptoms, instead of an immunity for four or five days.

"After its publication, cases were related in which there was no occipital displacement. In my own it was sometimes noticed, but in no instance did the depression seem to be a cause, but a result, and it became more marked as the disease advanced. The correct explanation is probably as follows: If the newborn infant becomes emaciated, the volume of the brain is diminished, like that of the trunk or limbs, and the sinking of the occipital bone simply corresponds with the amount of waste in the cerebral substance. In fatal tetanus nascentium emaciation is very rapid. Viewed in this light, the occipital depression, so far as it has any effect, must be regarded as conservative. It prevents serous effusion, which, in a similar state of waste, occurs in older children, whose cranial bones are consolidated."

Dr. Hüpeden (*Zeitschrift für Epidem. und Öffentliche Gesundheitspflege*, 1868-71) says:—

“Within six months of 1865, 100 cases had occurred in Elving, 21 of whom were in the practice of one midwife; the condition of the navel was supposed to be a cause, but the mode of dressing and care did not confirm it. In Lüneberg 14 cases occurred in 1867, 11 with one midwife (dirty sponges or bandages could not be proven as having been used). Instances being reported of many cases occurring among certain midwives, and none among others, gave rise to suspicion. Investigation resulted in one woman being ‘pensioned,’ after which no more cases occurred. ‘Anæsthesia’ of the hands of another woman, and hot baths, were thought to be causes, but were ‘disproved.’”

Dr. G. A. Ketchum (*Trans. Med. Assoc. Ala.*, 1871) believes that it is always a traumatic tetanus attributable to the umbilicus, but admits that other circumstances act as predisposing causes, such as hot weather, foul air, and too much bedclothing. In all his cases there has been more or less evidence of inflammation or ulceration at the umbilicus, or the navel has been fretted by the dressing or tight bandaging, and he condemns the practice of allowing the original dressing on the navel. Two cases are related—one died and the other recovered under the use of chloral.

Dr. J. Bierbaum says (*Deutsche Klin.*, vol. xxv., 1873):—

“The constitution has no effect, as the strong and weakly are alike seized. Neither has season an influence in its production. The true home of the disease, however, is in the South, particularly in the West Indies. According to James Clark, in America the smoke of green wood in the chimneyless huts of the negroes very frequently is the cause, but I doubt this. Here in Westphalia, on the contrary, in the chimneyless huts where the smoke is so thick that one scarcely can see or hear, where they burn green and dry wood, turf, and sawdust, the disease is rarely seen, or, at all events, is not seen oftener than in the clean dwellings of the well-to-do. A very high value has been placed on the activity of the skin as an etiological factor. It was observed in many cases where colds have been taken, and in many colds have nothing to do with it, nor atmospheric nor telluric influences.”

Dr. Stadfeldt says (*Archiv. de Tocologie*, 1874) that his experience is opposed to the umbilical theory. According to his notes of 20,806 births, the mortality of trismus was 1 in 224 births, 51 male, 42 female, 50 multipara, 43 primipara; all were fatal. Sex, nor duration of labour present no disposition in producing the disease. In 88 cases, 1 death occurred on the 4th day, 3 on the 5th, 13 on the 6th, 29 on the 7th, 25 on the 8th, 9 on the 9th, 7 on the 10th, 1 on the 12th. As opposed to the assertion that it prevails preferably in puerperal epidemics, he says that in 1854, there was a good deal of trismus and little puerperal fever, whilst the reverse was the case in 1864. Most of the cases occurred in summer.

In the *Amer. Journ. of Med. Sci.*, vol. lxi., 1875, Dr. P. A. Wilhite, of S. C., records 14 cases treated on Dr. Sims’s plan. Of this number, three cases of the acute form were cured by position alone, and two died without treatment before he saw them. The other nine presented the chronic or trismoid affection, five of whom recovered from position alone, and four succumbed without the discovery of the means of rescuing them. In all, the pressure was produced by depression of the occiput.

In the *Med. Record* for Dec. 2, 1882, Dr. J. G. Thomas, of Savannah, writes that adhesion of the prepuce produces a certain percentage of cases in male children, and cold draughts of air prove an active factor in causing the disease in both sexes.

The following references may be of interest, as showing chiefly the reports of cases treated successfully and otherwise by various remedies :—

Annales de la Méd. Physiol., vol. xvii.; *Edinburgh Med. and Surg. Journ.*, vol. xxxiii.; *Amer. Journ. Med. Sci.*, vols. vii., xvii., xviii., xlv.; *Archives Gén. de Méd.*, vol. viii.; *N. O. Med. and Surg. Journ.*, 1845–6, 1846–7, 1854–5, 1874–5; *Casper's Wochenschrift*, 1846; *Charleston Med. and Surg. Journ.*, vol. iii., viii., xii.; *St. Louis Med. and Surg. Journ.*, 1849, 1881; *Western Lancet*, vol. xiii.; *Southern Journ. of Med. and Phys. Sci.*, vol. iii.; *Nashville Med. Journ.*, vol. xv., xix.; *Chicago Med. Examiner*, vol. i.; *Gaz. des Hôp.*, 1862, 1863; *St. Louis Med. Archives*, vol. ii.; *Indiana Journ. of Med.*, vol. i.; *N. Y. Med. Journ.*, vol. x.; *New So. Wales Med. Gaz.*, vol. ii.; *Chicago Med. Journ.*, vol. xxviii.; *N. Y. Med. Record*, 1872; *Rich. and Louisville Med. Journ.*, vol. xvi.; *Phila. Med. Times*, vol. iii., v.; *L'Imparziale*, Florence, Italy, vol. xiv.; *Medical Reports*, Shanghai, 1876; *Amer. Med. Bi-Weekly*, vol. vi.; *Ohio Med. Recorder*, 1877; *St. George's Hosp. Reports*, 1879; *Atlanta Med. and Surg. Journ.* 1879–80; *St. Louis Med. and Surg. Journ.* 1881; *Mich. Med. News*, 1881; *Brit. Med. Journ.*, i., 1881; *London Med. Times and Gazette*, i., 1882; *Can. Med. and Surg. Journ.*, 1881–2.

In this connection, Copeland remarks :—

“If we consider the diverse, or even opposite nature of the measures which have been prescribed for this malady, their apparent success in some instances and their failure in others, and their employment in different states of the disease, with little regard to the navels, or their operations in relation to pathological conditions, we necessarily must infer that recovery has sometimes taken place notwithstanding their use, and not by their aid.”

Due warning of the effects of pressure, or approach of the disease, is given by the child being disposed to whine and cry; it may be subject to heavy, deep slumber, or starting in sleep; is languid, moans, cannot take the breast, although seemingly anxious to do so. A peculiar restlessness or twisting of the upper extremities while awake without evident cause, sudden changes of colour, screwing of the mouth, accompanied at intervals with a characteristic shriek, are reckoned sure forerunners. Generally, with one or more of these symptoms preceding, the infant is seized as if by an electric shock. These follow every few minutes, when “every muscle is thrown into distorted action, showing the wrinkled forehead, livid countenance, elevated brow, closed eye, dilated nostril, rigid masseter, fixed jaw, closed mouth, bubbling saliva, retracted head, turgid veins, arched spine, raised chest, troubled breathing, catching diaphragm, heaving abdomen, separated arm, squared elbow, bent wrist, clenched fingers, incurved thumb, extended legs, bent down toes, the whole figure rigid as wood—a pitiful sight.”

The paroxysm is renewed by a slight noise, the gentlest touch or zephyr. A placid interval of a few minutes succeeds, and then another fit follows. There is no uniformity about the action of the bowels or kidneys. Emaciation rapidly advances. The skin assumes a brownish hue, and hangs in shrivelled folds of leathery texture. Peace and pang pursue their sickening interchange, and the child sinks by degrees exhausted.

From such a history it is no wonder so many conflicting theories have been advanced as to the cause of this disease; in fact, anything that the writer happened to fancy or guess, has been offered.

In his first article, Dr. Sims very truthfully said that—

“The causes have been points of debate and conjecture, and of its true pathology we have never had any settled opinion. Its treatment has consequently been one of varied empiricism. Wherever are poverty, filth, and laziness, there will it be oftener found. Wealth, a refined mind, and affectionate heart, are comparatively exempt from the ravages of this unmercifully fatal malady. But, expose this class to the same *physical* causes, and they become equal sufferers with the first.”

In illustrating the great rigidity of the frame, in one of the cases that he reports, he caught hold of the feet and raised the whole body without flexing the thighs on the pelvis. He then ran his hand under the head for the purpose of elevating the body in the same way, when he immediately detected a *remarkable irregularity* in the feeling of the bones. *It had lain during the whole of its illness exactly in one position all the time, the weight of the head resting wholly on the os occipitis.* The pulse was uncountable, and the breathing, from 120 in a minute, was reduced to 70, with a corresponding amelioration of the other symptoms. This occurred within ten or twelve minutes after he had taken up the child for examination, and in this way he discovered the relation of *position* to the disease. The child dying the next day, a post-mortem examination showed the superficial vessels of the brain full of black blood, and coagulum occupying the whole length of the spine.

In his second article, published in 1848, Dr. Sims says that new facts and observations had satisfied him that deficient ossification of the cranial bones was not essential to the production of the disease; and it was not intended to be understood as a *pathological* condition, but simply the *physiological* state so necessary to a safe and easy parturition. He modifies his statement as to *dorsal decubitus*, having found that children may have trismus, and at the same time be kept on a feather bed, when they are laid upon what is usually called *the side*. He also admits that a child may die of the disease in its most aggravated form, and yet have no extravasation within the spine. He says the position is fully sustained—

“That trismus nascentium is a disease of centric origin, depending upon a mechanical pressure exerted on the medulla oblongata, and its nerves; that this pressure is the result, most generally, of an inward displacement of the occipital bone often very perceptible, but sometimes so slight as to be detected with difficulty; that this displaced condition of the occiput is one of the fixed physiological laws of the parturient state; that when it persists for any length of time after birth, it becomes a pathological condition, capable of producing all the symptoms characterizing trismus nascentium, which are relieved simply by rectifying this abnormal displacement, and thereby removing the pressure from the base of the brain.”

Of his first case of *trismoid*, or chronic form of the disease, that he saw he says:—

"If the occiput was so much displaced, and the child lived *five* months, how is it that they die very suddenly, and that often, when the occiput is so slightly displaced as to be scarcely discoverable? Let us examine the facts for an explanation. The child was kept all the time in a cradle, without a nurse. The cradle was too short to allow it to lie flat down, so it was kept in a semi-erect position, with its head supported by a large old pillow of chicken feathers, all matted together, the cradle was too deep and narrow to allow it to turn on its side, even if it had been strong enough to do so; the unvarying 'dorsal decubitus;' kept the occiput displaced; the semi-erect position threw the weight of the head on that point of the occiput between the occipital protuberance and the posterior fontanelle; this necessarily tilted the mesocephalon forwards against the cuneiform process of the occipital bone, and pressure exerted on the pons always produces chorea or paralysis, or both, in exact proportion to the amount and degree of pressure. The semi-erect position was altogether favourable to the prolongation of the disease (and of life), because, in a perfectly supine position, the weight of the head would have rested lower down on the occiput, which would have displaced the bone, so as to press more on the medulla oblongata and the eighth pair of nerves, and thus the patient would in all probability have died at a very early period of asphyxia."

He then passes on to a class of cases in which it is not so easy to detect the occipital displacement, and in which there will be less of the "dorsal decubitus;" but in which the true relative position of the bones may be readily detected, when the way of doing so is understood.

"One of two things must *invariably* exist: either the occiput will be under the parietal, or *vice versa*, according to the position in which the child has generally been retained. If it is not ascertained almost by the sight alone, I press the forefinger firmly against the occiput, about half an inch from the lambdoidal suture, and at a point about half way between the posterior fontanelle and the mastoid process. I now pass the finger slowly and cautiously across the suture; at every step making firm pressure. When the finger arrives at the suture, or commissure, if the occiput is under the parietal bone, it will be found to yield, and the finger, coming in contact with the edge of the parietal, will have to be elevated a little so as to pass over on to its free border; but if the occiput is on the outside of the parietal, then the finger meets with no obstruction; on the contrary, it glides smoothly over, and falls on to the parietal. The proof will be found in a retrograde manœuvre."

These teachings are fully in accord with my own experience. The arguments adduced by Dr. Sims all go to show that the disease is the result of pressure exerted at the base of the brain by *inward* displacement of the occiput, differing in degree from the slightest to the greatest. There is yet another class of cases which he describes, plainly caused by an opposite state of things, viz., by prolonged *lateral* decubitus, the occiput being *exterior* to the parietal bones, and in his paper he fully explains the mechanism of its production and the rationale of the symptoms observed.

I shall now consider those cases which came under my own observation, and which for convenience I have divided into three classes: 1st. Those that recovered under postural treatment. 2d. Cases in which post-mortem examinations were made, many of which were seen before death, but too late to render any service. 3d. Those whose history was obtained after death, the majority also having been seen before fatal results ensued, but where post-mortems were not permitted.

The first class embraces six cases, mostly of trismoid. This is to be expected for the reason that the acute form, which runs a more rapid course, is seldom seen by the physician, or when he is called the patient is generally in the hopeless stage of extravasation; or, on account of severity of the paroxysms, death has taken place from asphyxia. Hence I have included in the statistical table of 229 deaths which follows, all under a month old only. I made altogether about 150 post-mortems, but to save repetition, I have selected at random the 25 recorded in Class II., and the 18 in Class III., as a fair average of the general results.

The peculiar degree of pressure, as shown in Dr. Sims's illustration, accounts for what he appropriately denominates trismoid, or the chronic form of the disease.

CLASS I. CASE I.—On December 10, 1878, while visiting a patient, I was asked to see a dying child eight months old, not that it was thought I could do any good, but just to pacify the distracted mother. On entering the room Mrs. C. told me her baby had been sick since it was four weeks old, and at various times was under the treatment of three physicians—the last an irregular—for “bowel complaint and fever,” but nothing had seemed to give relief. The first thing she noticed was that the child began to fall away; it had diarrhoea, occasional vomiting, convulsive twitchings, and almost constant whining, crying, or fretting; when laid in the crib it would cry piteously, all the symptoms then becoming aggravated, and would roll its eyes and sway the head aimlessly backwards and forwards. All these distressing symptoms had continued steadily progressive, the loose bowels being especially marked, as many as twenty-two operations occurring in one day, chiefly of blood and mucus.

She said she had been expecting it to die every day, the doctors having given up all hope; it had repeated weak spells, and would lie apparently breathless with cold and clammy extremities, never sleeping as other children.

The child on first sight was the least promising case I ever saw. The pale and waxy look sadly portrayed its sufferings, and confirmed the history just given; it was indeed a living skeleton, presenting in addition the appearances of incipient hydrocephalus. Taking the little sufferer from its recumbent position, I carefully passed my hand over the parietal and occipital regions, and had no trouble in detecting an unnatural unevenness at the junction of these bones, the occipital being overlapped perceptibly by the parietals. By gentle manipulation the bones were adjusted with a snap, when (although it may appear fanciful) I was at once rewarded by a bright upward look of the child as though it had been suddenly relieved from great pain or shock. Even yet I felt doubtful that it could rally, and I did not allow my enthusiasm to exceed caution in the prognosis. I endeavoured, however, to explain to the mother that *position* was the last chance of saving life; that she must watch it, now that the bones were in apposition, and keep them so; that she should not lay the child on its back, but change it from side to side. As for medicine, none was needed. At my visit next morning the transition was wonderful. The mother, buoyant and happy, held the babe in her arms just awake from a natural slumber. She said she was so impressed with care in carrying out my instructions that she had not laid the child down since she saw me, having sat up with it the whole day and night; that she was

encouraged by the favourable change from the first, the child having had a long sleep, something so novel—indeed it had not slept at all for 48 hours before—and on awaking cried for nourishment, after which it began to look bright and notice things, and she now knew it was getting well.

Improvement continued, there being no return of a single bad symptom.¹

CASE II.—Infant of G. C., coloured, male, fifth child (one died of the disease when three weeks old), born March 31, 1879, and was perfectly well up to May 6th, when straining and griping pains of the bowels were noticed, followed by a marked convulsion with slight opisthotonos; this wore off in a few minutes and was succeeded by a calm sleep. The second and third paroxysms occurred the following day, crying, jerking, or moaning, filling up the intervals until I saw it May 8th. I found it extremely weak and emaciated, having refused food for two days. Examination showed the parietal bones overlapped by the occipital and quite fixed. Having given directions as to position, I left, and was accompanied on my visit next morning by Dr. Marsteller. There was a marked improvement, and it had nursed feebly during the night. The day following he was still further improved, now seizing the nipple without assistance; the fingers were also flexible, and the secretions normal. I saw my patient for the last time on the 12th and discharged him perfectly cured, without a dose of medicine.

CASE III.—Female child of Mrs. K., white, finely developed, three months old. I saw this case with Dr. Marsteller on the 28th September, 1879; was quite well up to the 23d, when it commenced to fret, and had an "inward spasm." The mother thought these were symptoms of teething, and was not alarmed until it became indifferent to the breast, followed by bloody discharges; whining and fretting were constant, and the only way it slept, or had relief, was when held erect in her arms.

Upon examination it was difficult to detect any irregularity of the bones, the head being so rounded and well formed; on the left side, however, there was some wedging and tenderness at the junction of the occipital and parietal. Pressure here produced such an aggravation of the symptoms that the mother, thinking we were injuring her babe, snatched it precipitately away. She said that the nurse was in the habit of laying the child flat on her knees, and bouncing it to make it quiet. I simply gave directions as to position, and was rewarded in the morning by the intelligence that it had slept well, and nursed a little better. The second day it was entirely relieved, and there was no further bad symptom.

CASE IV.—Infant of L. S., coloured, female, born October 11, 1879. On the 26th the mother called at the coroner's office for a certificate of death in the case of its twin brother. She stated that both had been sick almost from birth, and she was obliged to work, and leave them in the care of strangers. In her absence they were fed on the bottle, having only the opportunity to nurse night and morning, when they would attempt to take the breast, in the intervals of the spasms; these ensued about ten days from birth, both children being affected alike, the boy having just died. No physician in attendance.

Before leaving the office she asked for a certificate also for the girl, remarking that it would be dead before her return, but in reply to this request she was told she "had better wait until it died."

¹ Mrs. C. brought this child to see me last summer. He is now five years old, has remained perfectly well, and is a bright rollicking little fellow.

Happening to meet the coroner soon afterwards, he informed me of the circumstances, and accompanied by Dr. Clarke Patterson I visited the house, an overcrowded tenement in a healthy locality. The room, which was occupied by three adults, was full of smoke and the fumes of cooking. It was about seven feet high, and ten feet square, with two windows slightly raised and the door so situated as to favour the hurling of the cold wind through the apartment; a bed filling half the space, one chair, an old bureau, and the stove which blocked the entrance, constituted the contents. On looking around we beheld the dead child under the window ready for burial. It was yet warm, and the wrinkled emaciated countenance, flexed thumbs, and marked occipital depression, indicated the work done. On the only chair sat a coloured woman with the subject of this case in her lap, the occiput being pressed directly inwards. The child was so exhausted it could not afford a respectable paroxysm. There it lay, dried up, wrinkled, and frowning with suffering, the very picture of a septuagenarian; it jerked and grunted, and weak as it was, threw itself into painful contortions. These symptoms, the woman said, had continued all the week, she did not know how it was alive, and when she could do so she had fed it with a spoon. Although I did not think the child would live, I gave the usual directions as to posture, and offered a pecuniary inducement if she could arrange to care for it better. In a little while it took the bottle, seemed easier, and fell asleep.

As a certificate of death was not called for, the next day I visited my patient, and was agreeably surprised to find it better. The day after there was a further improvement; the fingers and thumbs were now flaccid, and it nursed freely from the bottle held in my hand. The weather being cold, I cautioned them again about exposure to the open window. I saw it well wrapped, and had reason to believe the child was steadily gaining. Recovery was complete on the fourth day. I therefore did not call again until the sixth, when, to my great vexation, symptoms of pneumonia presented, and the child died that evening.

Autopsy in 30 hours. Brain and cord *perfectly normal*. Lungs intensely congested.

Examination of the brother showed dotted extravasation, and congestion of spine and brain. Thoracic and abdominal organs healthy.

CASE V.—Female child of Mrs. A., five months old; was well up to the time her mother started with her from Montana. The long ride exposed it to an attack of pneumonia, for which I was first called. After the physical signs and other evidence of this disease had subsided for a reasonable time, I was at a loss to account for the fretful condition continuing. For several nights there was no rest for the mother or other relatives, the child constantly whining or crying—and it was only able to nurse sufficiently for a bare existence. My attention being directed to the head, I discovered an irregularity of the left occipito-parietal region; manipulation did not seem to effect any result. I directed the position of the child's head to be maintained in the usual way, laying great stress on the importance of this. A good recovery slowly followed.

It will be apparent that the symptoms of trismoid were at first obscured by the pneumonia, and that both conditions were due to the long ride, the mother holding the babe in her arms, which, with the motion of the train, added to the pressure on the head.

CASE VI.—Mrs. L. O., German, primipara, was delivered Feb. 5, 1882, by Dr. H. E. Leach, of twin boys; labour lasted 42 hours. The first was a breech presentation, the second was born 20 minutes afterwards, feet foremost. They did well up to the 12th day, on the morning of which the mother was awakened by this child crying; after nursing, it quietly went to sleep again. About 7 o'clock she was alarmed at its refusal to nurse, followed by a characteristic trismus paroxysm. About noon, when the doctor arrived, he found the spasms had continued almost without intermission. He notified me, and placed the child immediately in a proper position on the right side, having detected an unevenness on the left, when the spasms at once ceased, and did not recur until about 4 o'clock. This was induced by myself in presence of the doctor, but soon passed off on removing pressure of the finger on occiput. The child fully recovered. The hygienic surroundings were all that could be desired, and there was never a clearer illustration of cause and effect.

CLASS II. CASE VII.—On the 12th March, 1879, I was asked by Dr. Leach to see the 7 day male child of V. C., coloured. Had nursed heartily up to the evening of the 10th, when it commenced to shrug the shoulders, cry, jerk, and draw itself up, spasms soon following. We found it lying in a constrained position partially on the back, occiput pressing against the edge of a hard bolster. Upon examination marked depression of the occiput was discovered. The cord had dropped off the previous day, leaving a raw surface, through which unhealthy pus exuded.

In addition to postural treatment, calomel and chloral were ordered every two hours, with application of turpentine and sweet oil to the abdomen and spine. In the evening the child was thought to be improving. Next morning, however, developed no change except the greater exhaustion of the patient; paroxysms had continued at about the same intervals during the night. Death took place, just 72 hours from attack.

A very careful post-mortem showed no extension of the disease of umbilicus, the arteries and vein presenting a smooth healthy appearance; nothing was discernible in the peritoneum or liver. Lungs were highly engorged. A few small clots were found in the posterior portion of cerebrum and cerebellum; but the entire spinal canal, external to the dura mater, was lined with dark coagulated blood.

(I learned from the grandmother of this child that she had had 15 children, 9 of whom died before they were two weeks old from this disease.)

CASE VIII.—Female child of M. W., coloured, primipara, born March 14, died March 27, 1879, sick three days. Usual history, "was stiff all over;" laid mostly in a stupor during intervals of paroxysms, but there was visible evidence of suffering. I satisfied myself from questioning that the child's occiput rested chiefly on the mother's arm. A physician was summoned the first day, who failed to recognize the disease.

Autopsy showed marked occipital depression. Umbilicus healthy. Lungs and brain highly engorged. Spinal canal lined with coagula. Other organs normal.

CASE IX.—Female child of H. W., coloured, died April 1, 1879, aged four months. All that could be learned was that she had been sick one month, with occasional spasms, and was very much emaciated.

Post-mortem showed marked occipital depression, the left edge being more overlapped than the right. Large clots were found over the left

hemisphere; brain and spinal cord much engorged. Surface and substance of lungs studded with miliary tubercle. Other organs normal.

CASE X.—Infant of Sarah T., coloured, male, born May 16, 1879. Had first convulsion half an hour from birth, followed by four more, and died 17 hours after delivery.

Autopsy in 42 hours. Occipital depression and “looseness” of cranial bones from deficient ossification. Lungs, brain, and cord congested.

CASE XI.—Female child of L. W., coloured, born Sept. 12, 1879, seized sixth day, and died in 60 hours.

Autopsy 24 hours after death. Navel healthy. Occiput markedly depressed. Brain and pia mater congested, several hemorrhagic spots were seen in the meshes of the latter. Cord lined with coagula.

CASE XII.—Infant of C. G., well-developed coloured female, born Sept. 15, 1879. Was well up to the morning of 19th, when, on being put to the breast, refused to nurse. Upon being laid down it whined, and towards evening had crying spasms, repeated at short intervals during the night. Dr. Leach saw the patient next day, and I accompanied him later, when we found it comatose, thumbs flexed, surface livid, frothing at the mouth, etc.; convulsions had continued from time of seizure. It died 15 minutes after our arrival, having been sick 26 hours.

Autopsy 28 hours after death. Navel had fallen off the day it was seized, leaving the usual raw surface otherwise healthy. The right side of occipital bone was overlapped by the parietal, while the opposite was the case on the left. Pia mater of brain and cord deeply injected, mostly in posterior portion of former, with dotted extravasation; large clots in longitudinal and lateral sinuses. A bloody gelatinous fluid lined the spinal canal.

CASE XIII.—Infant of L. B., coloured, male, eighth month utero-gestation, delivered by forceps Sept. 16, 1879; was well up to morning of 21st, when it was taken with what the mother called a choking spell. I saw the patient next day with Dr. Leach; the course of symptoms exactly corresponded with case above. Death took place in the evening 28 hours from beginning of attack.

Autopsy 30 hours afterwards. Navel nearly healed. In this case the left side of occipital bone was overlapped by parietal, the reverse on the right. Same condition of brain and cord as foregoing.

CASE XIV.—Infant of A. H., coloured, male, born 23d Sept. 1879. Mother died the same day of puerperal convulsions after 60 hours labour. The child continued well up to morning of 3d October, when it had short respirations, and commenced to draw itself up and clench the fists. At 11 o'clock refused the bottle, convulsions soon ensuing, continuing until death 64 hours from attack. I saw this child with Dr. Leach on the second day; and although it was too late to expect recovery, I am convinced that the change of position prolonged life.

Autopsy showed congestion of lungs, brain, and cord.

CASE XV.—Infant of S. K., coloured, well-developed male, fourth child (one died of this disease two years before), born Oct. 6th. Was well up to the 13th, when it refused breast. Navel fell off fourth day, leaving a healthy surface; fretting, crying, and jerking first symptoms noticed. Paroxysms would last about ten minutes, and recur every five minutes, the patient becoming weaker at each successive one. Died in a spasm, sick 30 hours. Nursed heartily once during the disease.

Autopsy showed marked congestion of pia mater, and clots in posterior fossa and cerebellum. Coagula lined spinal canal. Other organs healthy.

CASE XVI.—Female infant of M. D., coloured, born Nov. 22, died Nov. 28, 1879. Was seized on the fifth day, sick 24 hours.

Autopsy 60 hours after death. Soreness of umbilicus, confined to surface. Spinal cord lined with coagula, and a few clots on posterior lobes of cerebrum and cerebellum. Other organs healthy.

CASE XVII.—Infant of M. G., coloured, female, 7 days old, died Jan. 14, 1880, 24 hours from seizure. Usual history.

Autopsy in 16 hours. Hypostatic congestion of posterior portion of lungs. Pia mater of brain intensely injected, with a few hemorrhagic spots. Spinal canal lined with coagula.

CASE XVIII.—Infant of P. W., coloured, female, died Jan. 26th, five days old, sick 28 hours. First symptom refusal to nurse.

Post-mortem showed extensive clots in brain and spinal canal.

CASE XIX.—Infant of J. S. T., coloured, female, 6 days old, died Jan. 28, 1880, 33 hours from seizure. Symptoms and post-mortem appearances same as preceding.

CASE XX.—Female infant of M. J., coloured, 7 days old, ninth child of healthy parents, only one living; from the symptoms narrated, it was evident four died of the disease within two weeks from birth. This child nursed well up to the sixth day, and died in 16 hours. A curious feature was the absence of usual paroxysms of convulsions, the principal characteristic of the disease present being the locked jaw, accompanied by indistinct moans and whining.

Autopsy 30 hours after death showed the occipital bone overlapped on the right side by the parietal, the reverse on the left. The frontal bone in precisely the same relation, probably by some accident, impinged upon and pressed down the cranial contents. The membranes and substance of the brain and sinuses were intensely engorged, the cord also, but no extravasation. Umbilicus healthy. Others organs normal.

CASE XXI.—Infant of S. H., coloured, female, born Jan. 25, died Feb. 2, 1880, sick 24 hours. Usual history of symptoms.

Post-mortem. Clots above and below cerebellum, and in spinal canal.

CASE XXII.—Infant of A. J., male, coloured, 9 day old, sick 24 hours.

Autopsy in 30 hours. Lungs and brain congested; extravasation in spinal canal.

CASE XXIII.—Infant of C. P., male, coloured, age 5 days, died Feb. 4, 1880, 24 hours from seizure. Usual symptoms.

Autopsy in 30 hours. Injection of pia mater, and dotted extravasation of brain. Spinal cord lined with coagula. Other organs normal.

CASE XXIV.—Infant of J. G., coloured, first child, healthy, well developed male, born Dec. 13, died Dec. 20, 1881. First symptom noticed refusal of breast the 5th day, when mother found the jaws locked, and in forcing with a spoon nourishment was returned. Soon the child commenced to quiver, double up its fists, foam and fret, and grunt and cry and whine, and roll the eyes, which train of symptoms continued with usual aggravation, stridulous breathing, and opisthotonos. There was tonic rigidity throughout, and during the clonic spasms the sufferer, a mulatto, would turn dark-purple. The only intermission of these symptoms occurred the night before death, when it had three hours' sleep, occiput pressing on mother's arm (its general position since birth, as she informed me). Awakening in a clonic spasm, gradually became weaker, it passed imperceptibly away, 36 hours from seizure.

Autopsy, assisted by Dr. A. A. Hoehling, U. S. N., 44 hours afterwards, showed marked occipital depression. Navel perfectly healthy. The pia

mater of brain, posterior meningeal and cerebral vessels and sinuses, turgid with black blood; the spinal veins were also injected with slight dotted extravasation. Lungs intensely congested, probably, due to severity of paroxysms, which produced asphyxia and death.

CASE XXV.—Male infant of A. B., coloured, primipara, born March 21, died March 27, 1882. Was well up to fourth day, when seized with usual symptoms; died in 36 hours.

Autopsy showed congestion of brain, cord, and lungs. Umbilical arteries and vein healthy throughout.

CASE XXVI.—Infant of D. C., coloured, male, born May 16, died May 27, 1882. Seized with the disease May 23d, first symptom, refusal of breast. A physician was called the day following, who prescribed salve for "a moisture, or ulceration of the umbilicus," but he did not see the patient again; there was no mitigation of symptoms.

Autopsy 24 hours after death in presence of Dr. Hoehling. Navel normal. Thumbs still flexed and inward arching of feet. Apex of occipital bone dislocated and depressed a quarter of an inch, but right parietal overlapped more than the left; occipito-frontalis muscle and scalp very livid; bowels somewhat stained by bile. Lungs congested, more in lower lobes, and nearly collapsed—lower lobes almost sunk in water. Umbilical arteries and vein perfectly normal. Posterior surface of cerebrum and cerebellum loaded with coagulated blood; surface of brain intensely congested. Spine also lined with coagula. (The mother of this child lost her first of same disease 13 months before; was nine days old—sick one day.)

CASE XXVII.—Another case, coloured, male, 4 months old, that I examined about this time, was very much emaciated, and with nothing else abnormal except congestion of the brain and cord. It ran the usual course, and there was apparent depression of occiput. On questioning the mother as to whether the child generally lay in her arms while asleep, she said, "I had seven children, and didn't use them to that, because it made them so cross—they cry all the time, and want you to hold them."

CASE XXVIII.—Infant of G. R., coloured, female, fourth child (two others died of the disease), taken sick on the seventh day and lived 10 hours; paroxysms almost continuous and extremely violent.

Post mortem in 32 hours. Umbilical vessels normal. Lungs congested, the left collapsed; right auricle of heart distended. Pia mater of brain slightly congested. Spine lined with reddish gelatinous matter within theca—removed for microscopical examination by Dr. Griffith. Cause of death asphyxia from severity of spasms.

CASE XXIX.—Infant of A. B., coloured, female, one of twins born Feb. 1, 1883. When eight days old the mother was driven out of her room at the point of a pistol, and in running up stairs with both infants she thought she knocked the head of this one against the wall. On the following day it was seized with the disease, and died on the 14th. During its five days' illness the child could not take the breast, and regurgitated everything given with the spoon.

Necropsy in 30 hours. Umbilicus and organs of chest and abdomen healthy. Pia mater of brain congested posteriorly, reaching up to the vertex. Cord lined with coagula; removed for examination by Dr. Griffith.

CASE XXX.—Female infant, coloured, second child, born Feb. 11, 1883; labour lasted 20 hours. Was well up to about noon of 16th, when it awoke crying, and soon refused to nurse, spasms following six hours later. These continued in quick succession until death next morning.

Autopsy in 5 hours. Navel healthy. Lungs highly congested. Pia mater of brain congested, also the cord, with slight extravasation, which was taken to Dr. Griffith for examination.

CASE XXXI.—On the 15th April, 1883, I made autopsy of another boy of mother, Case XX. He was seized on the sixth day and died within 24 hours. The apex of occipital bone was bent inwards from the protuberance (like the other), forming a very decided ridge more on the right side. Experiments showed this to be one of those cases where an operation could not avail, on account of the probable difficulty in retaining the inwardly arched bone *in situ*. Indeed, there was an evident line of demarcation, or want of union between the point of ossification here and the protuberant portion. Another interesting feature of the case was a small abscess of both umbilical arteries opposite the fundus of bladder; a probe easily passed from it through the navel, which had apparently healed, but there was no congestion or inflammation of peritoneum surrounding. Left lung was intensely engorged. The normal bright pink appearance of the upper lobe of right lung was in marked contrast with the dark congested state of the middle and lower ones. The surface of brain was much engorged, with slight extravasation in the posterior lobes and cerebellar fossæ. Spinal cord lined in its anterior, and chiefly lower portion, with reddish gelatinous matter, which has been seen, but not noted in many of the other cases examined by Dr. Griffith.

CLASS III. CASE XXXII.—This, an almost parallel case to that of the child of Mrs. C. (Case I. Class I.), I saw, through the kindness of the coroner, Dr. Patterson. Being called to give a certificate of death, his attention was directed to a sick child, male, of S. W., about four months old, lying in a crib. He made an examination of the head, and endeavoured by manipulation to adjust the occipital, which he found overlapping the parietal bones, but failed to do so.

Arriving at the house, the mother informed me that her baby was sick since birth, never having had a well day; that it constantly fretted, whined, or cried, and would toss about and feebly beat its head, refuse nourishment, etc.—it had not grown at all, and was not much more than a skeleton. This history was but a tame expression of the child's suffering; its truth was too plainly told on the shrivelled, painful countenance, and although four months old it had not attained the average weight of an infant at full term. My examination of the head confirmed the character of displacement reported by Dr. P. I found the right parietal bone more deeply overlapped, firmly locked, and impossible to release by manipulation. The child was so low I explained to the mother the necessity of immediate interference, even by an operation. (The one I proposed to perform is Dr. Harrison's, described by Dr. Sims, which simply consists of the introduction of the point of a knife cautiously, to pry out the bone.) The husband not being present to give his consent, I deferred it till the next day if the child was then living. It died, however, during the night. No post-mortem was permitted.

CASE XXXIII.—Infant of C. T., coloured, male, died Jan. 10, 1879, twelve hours after birth; seized with convulsions immediately after delivery, continuing until death. Marked inward displacement of occiput.

CASE XXXIV.—Male child of Mrs. P., white, well developed, born January 4, died January 11, 1879. Parents well-to-do Germans, residing in a dry, healthy part of suburbs; third child they lost by this awful mal-

ady, the first living but one day, the second but four days. Mrs. P. informed me she had no attending physician; that the baby thrived well until the fifth night, when it refused the breast, and soon afterwards had a crying fit. She showed me how she sat up with it in bed, the occiput resting on her thigh. (About three years ago a fourth was born. On meeting the mother a few months since, she thanked me for my suggestions and explanation of the cause of the disease, as she believed this last child was preserved on account of such knowledge.)

CASE XXXV.—Female child of B. T., coloured (mother of seven children), born January 13, 1879; taken sick fourth day, died in fifteen hours—refusal to nurse first symptom. I could not obtain an accurate history. There were “inward spasms,” however, and stretching of body and limbs, “head burned up with fever.” For an hour or more pressure on the occiput was probably accidentally relieved, as the child nursed once heartily, symptoms recurring after laying it down.

CASE XXXVI.—Infant of M. A. M., coloured, perfectly developed healthy female, born January 8, 1879, died January 16, after thirty-three hours’ illness. Was well up to night of 15th, when the first thing noticed she refused to nurse. Upon being laid down, it shrieked, whined, and had crying fits, and jerking spasms. During fits the head was thrown back, mouth frothing, countenance frowning, fists doubled up or locked in front of breast. The nurse explained that when sitting up in the arms there would be a temporary subsidence of symptoms, but when she placed it in her lap they became aggravated. This led me to ask the exact position of the child when in her lap, which she illustrated with another child, showing me clearly that the whole weight of the head had rested on the occiput across her knee. During the course of the child’s sickness it would repeatedly try to take the breast, jaws were stiff, eyes alternately open and shut, and no sleep from the time of attack. Navel looked healthy. Inward displacement of occiput.

While in the room investigating the case, one of the women present remarked that when she laid her child on the back, “it looked like it was dead, and would seem strangled, until I rushed and changed it on the side.” Another said she lost hers by crying fits on the ninth day, after thirty-six hours’ sickness, one of the first symptoms she observed being that the child would wake in fright and jump, after being laid on the back for some time.

CASE XXXVII.—Another case of trismoid was the adopted child of J. T., white, male, five months old, where I was called January 20, 1879, through the courtesy of Dr. Patterson. This case also presented the appearances of hydrocephalus, the picture of suffering being depicted in countenance, even after death. History exactly similar to the others. Parietal bones overlapping occipital.

CASE XXXVIII.—Infant of J. H., female, white, born Jan. 26, died Feb. 1, 1879. This child was puny from birth, and was not able to take the breast, although it repeatedly made efforts to do so. When laid on its back, or held by the mother, the head resting on her arm, it would whine and “have fits of little jumping.” On the 30th, it refused nourishment entirely, the next day became worse and died. I took pains in this case, again, to see the exact manner in which the child was held, the result showing that, as a rule, the occiput rested on the arm or lap.

CASE XXXIX.—Infant of L. T., coloured, female (seventh child—three stillborn—and from the history given, one of the others died of trismoid,

three months old), born Feb. 1, died Feb. 12, 1879, sick 24 hours. Born with convulsions, which continued till next day, then nursed heartily until they recurred on the 11th. The mother, on noticing the fixed jaws, from that moment gave the child up; life went out imperceptibly.

CASE XL.—Female infant of S. M. coloured, born Feb. 14, 1879, although fully developed, was never well; the first night had quiverings, groaned and fretted. It continued in this condition until the 20th, not having nursed at all, when convulsions ensued, following in rapid succession until death on the 22d. "The child during the attacks would froth at the mouth, become stiff, and turn blue."

CASE XLI.—Female child of E. H., seven days old, third lost by this disease; attacked the fifth day. Usual symptoms; died in 36 hours.

CASE XLII.—I was called on the 22d Feb. 1879, to see the female infant of J. T., coloured, seven days old. I found it in a characteristic spasm, lying on its back in the lap of an old midwife. I took up the child, examined the occiput and found it overlapping the parietal on the left side, while the reverse was the case on the right. By this time, the convulsions ceased, and the face and neck gradually resumed a natural tinge. After persevering manipulation, I relieved the displacement to a marked extent, and for more than half an hour it continued comparatively calm. The mother told me this was her third baby, the labour lasting only three hours. Her first had had spasms when two weeks old, but recovered, and had them again in a month, when it died. She pointed me to her second, a bright healthy-looking child about two years old, who also had spasms when an infant. The baby in question was strong and vigorous, and nursed heartily up to 7 o'clock the evening before I was called, when suddenly it commenced to fret and stretch itself; it "got weak in the jaws" about 9 o'clock, and refused to nurse. She gave colic mixture for the "rumbling of wind in the stomach," but it continued fretting and jerking, and getting worse all night. The first severe spasm occurred about 6 o'clock, since which time up to my arrival (eight hours after), they continued every half hour, lasting over five minutes.

Upon directing my attention more closely to the patient, I found it was in a comatose condition; the eyes and hands were shut, the thumbs firmly grasped between the two first fingers, the pupils contracted, requiring force to examine them. There was nothing unnatural about the bowels or urine. Before leaving, I gave directions as to proper position. In the evening the child continued unconscious, although there was no aggravation of the other symptoms, until just after my arrival, when a severe paroxysm occurred, from which it seemed impossible to recover. Gradually, a deep lividity spread over the face and whole body, and it lay, painful to behold, bent in the position of opisthotonos; this quietly passed off, being quickly succeeded by little jerking. The respiration was now hurried and irregular, and pulse imperceptible, jaws continued fixed and tongue tightly held between the gums. In this condition it lingered till the following day. I had the theory from the first that extravasation had taken place early upon the brain and spinal cord, which accounted for the comatose condition and opisthotonos, and change of position nor anything else could have saved life. No post-mortem permitted.

CASE XLIII.—Infant of M. L., male coloured, born Feb. 26, 1879, 23 days old. First had spasms when a week old, which passed off without treatment. It nursed and continued well up to the evening before death, when "it commenced to draw itself up and look as if something hurt it

inside; no passage from the bowels but straining and rumbling of wind; jaws were weak—had snuffles and grunted—rolled the eyes and doubled up the fists in spasms.” Occipital depression well marked. No history of soreness of navel.

CASE XLIV.—Male child of L. S., four months old, light mulatto, was attacked on the 23d March, 1879. Indifference to breast, low whining, jerking, etc., first symptoms noticed. These continued aggravated from day to day, until the 31st, when Dr. Leach was summoned. I accompanied him in the morning, and found the child's head almost at right angles with the trunk, presenting the most marked case of opisthotonos I ever saw. It was in the mother's lap, occiput resting as usual on the arm. Examination showed occipital depression, the left side being more overlapped. I placed it on right side lengthwise on a pillow, and continued to watch it a few minutes, when the old granny said that was the first rest it had since taken, adding that, when lying in her arms or lap, it was all the time a whimpering, kicking, and seemed uneasy. Although the child was four months old, pressure on the occiput with the finger produced at will an aggravation of symptoms. It was so exhausted when we arrived, that death followed in a few hours.

CASE XLV.—Female child of M. G., coloured, born April 9, 1879. Was well up to evening of 14th, when the first thing noticed was hoarseness, then refusal of breast, spasms occurring 12 hours later. The disease ran an acute course with usual symptoms intensified, death following 20 hours from seizure. The lambdoidal and sagittal commissures were fully one-fourth of an inch wide.

CASE XLVI.—Male child of L. C., coloured, seven months old; never seemed to be well. I saw the case on the 12th April, and found marked displacement of occipital bone. It was very much emaciated, and lay in an occipito-parietal position, grunting and jerking, eyes fixed, and thumbs flexed on the palm. The whole body was rigidly curved backwards. The child was in articulo mortis, and died the same evening.

CASE XLVII.—Male child of J. D., white, aged 5 days, born April 24, in an elevated and healthy portion of the county; died April 29, 1879. This child commenced to nurse on the 26th, continuing regularly until midnight of the 28th, when its refusal was the first symptom noticed; the day before, however, it was observed to moan when asleep. The mother laid it generally on her arm, either on the back or side. After the refusal to nurse, it would cry and be fretful, draw itself up as if it had cramps, would clench its fists, and froth at the mouth; it was then discovered that the jaws were fixed, and the child could not swallow, a soothing mixture being returned, mixed with froth. The first convulsion occurred 8 hours after the refusal to nurse, and they continued about every half hour, lasting sometimes ten minutes; towards the last they came on every five minutes. During these paroxysms the face and neck were particularly livid, and the head rigidly thrown back. Illness lasted 24 hours.

There was marked occipital depression and “looseness” of cranial bones, from deficient ossification. No inflammation of umbilicus. The mother observed that when laid on its side flat on a pillow, there was a general lull of symptoms. The robust health of the parents, the scrupulous cleanliness, and the remarkably healthy surroundings were especially noticeable.

CASE XLVIII.—Infant of S. G. C., coloured, female, born Nov. 4, 1879, was well up to night of the 19th, when, after being nursed and laid down, awoke in about an hour fretting and crying. The mother tried to

quiet it by offering the breast, which was refused. There was not much change until early morn, when the first spasm occurred; symptoms ran usual course, death taking place 33 hours from attack. I saw the case six hours afterwards. Occiput very much depressed; indeed, it could not be otherwise, on account of the lack of development of the bones, allowing nearly half an inch space at their junction, which gave a loose baggy feeling to the head.

CASE XLIX.—Infant of M. G., coloured, male, born Dec. 7, 1879. I was called to see this case on the sixth day from birth. The mother told me it was well and hearty up to the evening of the 12th, when it was taken sick with a pain in the stomach, and crying, soon commenced to stretch himself and draw his arms up. He went to sleep for an hour or two, and, on awaking, “looked as if he had a stopping in the head, was a kind of choked, and couldn’t get his breath” (stridulous breathing). At times he turned black in the face, and she would try to nurse him, but he couldn’t take hold; he continued to snuffle and choke and strangle. The first spasm occurred about 8 o’clock, being repeated every fifteen or twenty minutes, and lasting one into another. In this condition I found him. The paroxysms were so severe and well marked, accompanied with lividity and opisthotonos, that extravasation had too evidently taken place. I put him on the side, and attempted to feed with spoon, but the power of deglutition was gone. Death occurred during the night, thirty hours from attack. Examination before death showed plainly depression of the occiput on left side, and the natural relation of the bones on the right. Navel had sloughed off on the fourth day, leaving a perfectly healthy surface.

The following tables represent the mortality for four years of cases under 30 days coming under the Coroner’s jurisdiction.

Year.	White.		Colored.		Age.																	
	M.	F.	M.	F.	Under 1 day.	1 day.	2 days.	3 days.	4 days.	5 days.	6 days.	7 days.	8 days.	9 days.	10 days.	11 days.	12 days.	13 days.	14 days.	15 days.	16 days.	17 days.
1879	5	3	23	31	6	...	1	2	1	10	7	14	4	6	2	1	1	1	5	1	...	1
1880	2	1	30	31	...	1	2	4	3	13	7	14	6	3	2	1	2	...	3	1
1881	4	2	29	14	...	2	1	4	1	1	6	8	9	3	1	4	...	1	3	1	...	2
1882	2	1	31	20	...	2	...	2	1	9	10	13	3	5	1	1	3	...	1	3
Total	13	7	113	96	6	5	5	10	6	33	30	49	22	17	6	7	3	2	14	2	1	7

Monthly Mortality.

Year.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	
1879	7	8	4	3	4	6	4	2	7	8	5	4	
1880	5	9	5	5	2	10	6	3	7	4	6	2	
1881	5	4	3	2	1	2	7	3	6	6	8	2	
1882	4	5	3	3	8	2	3	2	8	6	4	6	
Total	21	26	15	13	15	20	20	10	28	24	23	14	=229

It will be seen that, during the six warm months, viz., April, May, June, July, August, and September, 106 deaths occurred, or nearly one-half of the whole number, showing that the disease does not prevail in any one season more than another, as claimed by some authors. It will be further noticed that the term "9 day fits" is a misnomer, as only 17 of the 229 died on the ninth day, or 7.4 per cent. That sex has nothing to do with the disease will be observed also from the table, the small increase of males being merely in proportion to general statistical results.

The coloured element largely predominates; but this again only bears a general ratio to other diseases, and does not arise from any "peculiar organization" or "hereditary tendency." For, according to the annual statement of deaths of all ages certified by the coroner for 1879, one of the years mentioned, although the white population was two to one, of the whole number (625), 484, or 77.4 per cent. were coloured. Another important factor which swells the mortality among coloured infants is, that many mothers being employed during the day, their babies are neglected, or left to strangers, and very often allowed to remain hours at a time in a crib, generally on the back. It is proper to say that the table includes a large number reported as "convulsions," whose history was exactly the same; this was done pending these investigations, and following the usage of other physicians. To a great many in general practice trismus is an obscure disease; an infant is found in a paroxysm of convulsions, and the death certificate so records it.

The following shows the age, when seized, of 209 cases: At birth 15, 1 day 2, 2 days 13, 3 days 10, 4 days 39, 5 days 34, 6 days 35, 7 days 17, 8 days 9, 9 days 8, 10 days 7, 11 days 6, 12 days 3, 13 days 3, 14 days 1, 17 days 2; 18, 19, 20, 23, and 28, 1 each. (Of those sick from birth 1 lived 30 days, 1 7 days, 1 5 days, 1 3 days, 1 36 hours, 1 33 hours, 3 1 day, 1 17 hours, 2 12 hours, 1 10 hours, 1 5 hours, and 1 1 hour.)

Of the 229 in the table, the duration of disease of 207 only could be ascertained, as follows:—

1 lived 1 hour; 1, 2 hours; 1, 6 hours; 1, 10 hours; 2, 12 hours; 1, 14 hours; 2, 15 hours; 2, 16 hours; 1, 18 hours; 74 about 1 day; 1, 28 hours; 1, 30 hours; 2, 33 hours; 1, 34 hours; 8, 36 hours; 66 about 2 days; 24, 3 days; 9, 4 days; 1, 5 days; 1, 6 days; 4, 7 days; 1, 11 days; 1, 14 days; 1, 30 days.

The table below shows the mortality under a month, during the same period, from all other causes combined, such as violence, congenital debility, premature delivery, etc., not including stillbirths.

Year	White.		Coloured.	
	M.	F.	M.	F.
1879	13	14	39	32
1780	12	5	29	31
1881	6	4	32	27
1882	12	7	39	39
Total	43	39	139	129 = 341

This demonstrates only a trifling difference in the percentage of males (55 to 52 $\frac{1}{3}$) compared with the trismus table, and ought to dispose of the latest theory that adherent prepuce is largely the cause of the disease. The increase of whites in this Table is due no doubt to the equal likelihood of accidents and violence, as it includes chiefly the poor, or those in the same station that the coloured represents.

Now, with regard to the identity claimed between this disease and tetanus in the adult, it will be apparent that the statistics presented do not confirm this view. It is also disproved by the comparisons of Dr. Sutton and others, previously given. Holmes mentions 277 cases of traumatic tetanus, of which only 130, or 47 per cent., were seized within ten days after the injury. I was enabled to learn the time of seizure from birth in 209 of my cases of trismus, of which number 189, or 90 per cent., were under 10 days; while of the 88 reported by Stadfeldt, only one survived the 10th day. Matuszynski's 25 were all seen before the 9th day; and 107 of the 114 of Clarke's died before the 9th day.

In a table of 327 fatal cases of tetanus in the adult, also reported by Holmes, 79 succumbed within two days, or 24 per cent. I ascertained the average duration of sickness in 207 of my cases to be 50 hours, of which number 165 lived two days and under, or about 80 per cent., and 86 lived one day and under, 41.6 per cent.

Another point in refutation of this claim of identity is the fact that in the tetanus of the adult febrile excitement is not essential, and if present is only secondary. Indeed, O'Beirne states that of 200 cases observed by him, not one was accompanied by fever. In every instance of trismus nascentium where I took the temperature, when the disease was at its height, I found an elevation; one case that I saw with Dr. Shadd of the Freedman's Hospital reaching 105.4°.

Neither are the post-mortem appearances alike. The brain, medulla, and cord have been found in various conditions in the adult, but very rarely if ever have coagula been seen, although universally present in the infant. The similarity of these diseases in other respects I admit, but their etiological relation I deny. The principal basis of identity claimed is the trauma necessarily inflicted in the cutting of the cord at birth, irritating dressings, etc., to navel, which is supposed to correspond with the wound in the adult.

An analogy to eclampsia has also been claimed by some writers. In this connection the following remarks of Dr. J. Lewis Smith accord with my own observation. After describing mode of attack and paroxysms of eclampsia—which differ widely from trismus—he says:—

“Death does not ordinarily occur from one attack. There are several at intervals, during which the stupor is gradually becoming more and more profound, till finally there is total loss of consciousness and sensation. This is the most frequent mode of death, namely, from coma. . . . The only disease for which there is danger of mistaking eclampsia is epilepsy. (We all know what a

far remove this is from trismus.) M. Ozanam mentions the following means of distinguishing the two: 'Eclampsia differs from epilepsy in the frequent occurrence of prodromic symptoms, the clonic form of the convulsions, the rare appearance of froth in the mouth, the absence of a hideous aspect of the countenance, the spasmodic and sobbing character of the respiration, and a state of quiet without snoring which succeeds an attack. Eclampsia consists in a rapid, forcible, and involuntary muscular contraction *alternating with relaxation*.' In trismus there is generally tonic rigidity throughout."

Another difference: "Eclampsia occurs at any period of infancy and childhood, and is either idiopathic, symptomatic, or sympathetic. The most common cause, however, of clonic convulsions is the presence of some irritant in the *primæ viæ*. Dentition, worms, etc., are also causes."

With regard to trismus he says: "To one who has seen this disease in the new-born, or is familiar with its symptoms, diagnosis is easy. The symptoms which possess diagnostic value are more manifest and reliable than in most other infantile affections."

The symptoms of congestion of the brain, or apoplexy, have likewise been advanced as analogous, but the inability to suck, pointed out by Dr. Sims, must be regarded as pathognomonic of trismus nascentium. An equally unfailing sign that I have observed is opisthotonos, which *invariably* accompanies congestion or extravasation of spine, and is not present in congestion of the brain.

The umbilical cord has been the most generally accepted cause of the disease, because in many instances—probably from the twistings and contortions during paroxysms—a lesion of this sort has been found associated; but it has been also shown that extensive inflammation here has not produced a single symptom of trismus nascentium. Every physician observes tenderness or redness of the navel, and knows that this is only the normal state attending the process of sloughing, or the few days following. How common it is for his attention to be called to the "baby's navel not healed yet," or "something is the matter with baby's navel," but does he find trismus? Chanier (*L'Union Méd.*, 1879) gives the case of a *healthy* infant born at full term, in whom the cord was green and red, flattened, and as if belonging to a still-born fœtus. In a five weeks' old infant that died of asphyxia from being accidentally overlaid, I found coagula and yellow matter lining the outer portion of the commencing obliterated umbilical arteries, while the inner were glistening white and healthy, but this coagula is only the well-known physiological effect of the ligature. The areola around the umbilicus was nothing more than the stain of bile and decomposition.

When inflammation of the cord, with or without suppuration, is present, it sometimes extends inwards, producing convulsions and death. These cases are liable to be mistaken for trismus, and in a few I examined there was generally peritonitis, but no extravasation along the spine. I have also examined several infants, under a month old, who died of other diseases, with a like absence of extravasation. Dr. Mildner, of Prague, who has recorded the results of 46 cases of fatal inflammation of the umbilical vessels in children born in the lying-in hospital of that city, states that

convulsions occurred in only five of the number, and that in no instance had these convulsions the least resemblance to those which characterize trismus. Dr. Thore says: "With regard to the umbilicus, the condition described by authors may be produced or developed during the disease. In my experience there is nothing more common than inflammation of umbilicus, and nothing more rare than trismus."

Dr. E. Goldmann, of Texas, says that he has seen many cases in which no lesion of any kind could be traced to the navel. On the other hand, he had seen a number of children with navels ulcerating for weeks with considerable tumefaction and redness around, and yet without tetanus intervening. According to Gaillard, the soreness of the umbilicus cannot be regarded as the peculiar pathognomonic lesion, since it is so frequently observed without the supervention of trismus. Dr. Hancock, of Edinburgh, is opposed to cutting the cord, on the ground that it produces the disease; while some observers in the Southern States found the practice of not cutting the cord was limited to a stray midwife, and was invariably attended by fatal results.

Another point which the advocates of the umbilical theory seem to have overlooked, is the fact that no nerves have been traced to the cord. Who has ever observed the slightest evidence of pain or uneasiness in tying it? How then can the "reflex irritation" of Baldwin be explained? Dr. Woodworth, of Miss., while not advancing any theory as to the cause of the disease, thought that "physicians who attribute it to tying or dividing the funis improperly, must forget that the funis is not supplied with nerves."

Dr. Sutton, replying to the position taken by Dr. Watson, says, "but I do not suppose Dr. W. means that the wound inflicted on the cord, *per se*, ever gives rise to trismus. We know of no nutrient vessels in it, no nerves to direct vital operation." Among my own endeavours to ascertain something satisfactory on this point, I addressed a letter to Dr. Francis Delafield, of New York. His reply was, "I have no knowledge concerning the nerves of the umbilical cord."

If anything more is necessary to refute this umbilical theory, I invite attention to the following extract from a lecture by Edmund Owen, F.R.C.S. (*Brit. Med. Journ.*, i. 1880):—

"I will now allude to a strange condition of the umbilicus, of which I have seen a good many examples. Close around the cicatrix is a red and irritated or eczematous patch of skin, whilst from the depths of the umbilical fossa oozes a thin purulent fluid. For the cure of this affection lotions and all other kinds of dressings avail nothing; for, at the bottom of the depression, and hidden by overhanging folds of skin, there is a small fleshy polypus which has sprung up from the scar of the fallen umbilical cord."

This description would seem to accord with that given with so much minuteness by Colles and Von Busch, and claimed by them to have been the cause of trismus nascentium.

The next prominent theory in the etiology of the disease is cold or draughts of air. It is well known that the gentlest zephyr will very often seem to renew the paroxysms. I do not believe that it can produce the disease *per se*. On the contrary, a more natural result would be bronchitis, and like inflammatory conditions in such an active capillary system as the infant's.¹

It seems unnecessary to dwell on the numerous other causes ascribed as producing this disease. It has been shown that climate or season exerts no special influence. Dr Goldmann attributed a case to neglect in shutting the windows before a storm, and claimed that the disease prevails on islands in proximity to the sea more than elsewhere; yet, according to West, we have an example of almost entire immunity in Ireland. Another writer (Gaillard) starts out with the assertion that it is well known to be more common in warm than in cold climates, and before his article is finished the statement appears, "the disease is most frequent in the cold, damp, and variable months of winter and spring." While Watson ascribes the predisposing causes to indigestion, heat, etc., and that "it attacks so frequently on the ninth day after the cutting of the funis that it has been termed nine-day fits."

This brings me to the final consideration of the purport of this paper, viz., the establishment of the true cause, and the prevention and cure of trismus nascentium. After the publication of Dr. Sims's articles, cases

¹ Cold, as a cause of simple congestion of the spine, is, however, generally interesting. I do not deny its possibility to produce many of the symptoms of this disease. But as age advances, with the corresponding development of the nervous system, it must manifest its influence in a more varied form. A peculiar case of hysteria in a young girl, accompanied with paralysis of cervical muscles, reported by Dr. D. W. Prentiss before the Medical Society of the District of Columbia last spring, was clearly attributable to a long ride in an open buggy, the nervous symptoms following, or being associated with an acute synovitis. This suggested to me that hysteria is often an effect of local or circumscribed congestion of spine, and that in cases arising from this cause, our treatment is often radically wrong. Generally, local congestions, in persons otherwise healthy, are a sequel of cold. We have inflammation of one lung, lobular pneumonia, or any acute inflammatory condition from this cause, always preceded by a stage of congestion. And why should not congestion, local or circumscribed, take place in the spinal cord as well as in any other organ or part of organ, as an impression or shock of cold, and remain passive say from absence of the peculiar tissue or vascularity that favours or develops inflammation? It seems to me this is the philosophy of hysteria following such a history, and when we have an aggravation of the mental and physical symptoms, could it not be accounted for by extension, or the impression being conveyed upwards to the medulla, pons, and brain? Such congestion, when long-continued, would produce exhaustion of nerve power by pressure around the crura, or origin of the optic nerve, accounting also for the temporary blindness sometimes seen in connection with these cases.

Assuming, therefore, that hysteria is an effect of minute or larger local congestions of spinal cord following the impression of cold, I repeat, is not the treatment of this condition often radically wrong? It would at least be curious to employ assafoetida, bromides, etc., instead of antiphlogistic measures for congestion or inflammation elsewhere.

were reported for and against occipital displacement. Those with whom the practice was successful naturally espoused the theory; while the majority seemed to have derived no benefit from such treatment. This was probably due to a want of true understanding and continued investigation of the subject. Dr. Sims said himself he had not explained everything in connection with it; that his observations were but a small beginning. It is our privilege to give the results of four or five years' perseverance in the endeavour to elucidate this subject. The physiological explanation showing the effects of pressure on the base of the brain, so admirably described by Dr. Sims, which experiment I have myself repeatedly performed with entire satisfaction, leaves nothing more to be said on that point, except to add, that the duration and frequency of convulsions depend upon the degree of pressure. For instance, I have observed in the acute form, that when the convulsions continue a certain length of time, extravasation ensues and the case becomes hopeless. In cases of deficient ossification, where the bones are loosely attached by their commissures, or where the displacement is easily detected, the symptoms occur sooner, and are more aggravated, the majority dying in a few hours.¹

Where one side is overlapped, the disease is milder; and when the displacement is hardly perceptible, the symptoms are apt to continue many days. These facts will be apparent from an analysis of the cases of Class II. and III.

To better understand the pathology and rationale of the production of the disease, it will be remembered that the child's head before birth has for its pillow the soft cushion of the liquor amnii. At birth, and for some time subsequently, the cranial bones are not united, are thin and without diploë. It is reasonable to suppose that the transition to a different usage will cause them to be easily displaced, or the occiput to be depressed, the degree and character depending upon position or management. The mother may allow the head to lie on her arm or lap during nursing, or the nurse may place it in a like position, or the child may be retained in the recumbent posture on a hard mattress, an old quilt, or a bunch of clothes, as Dr. Sims says, wadded up and stuck under the occiput. And here I may be permitted in illustration to offer a characteristic extract from one of Dr. Sims's cases.

"The mother said that there had always been great difficulty in getting the child to suck; that sometimes it could not draw the breast at all; and very often would stop before it got half through; and that this had been the case from the time it was a week old. I requested her to suckle it (it was now quiet; had been for some time lying on its side). She took it up from the bed and applied it to the

¹ This is the class that would accord with Dr. J. Lewis Smith's expectations that "if Dr. Sims's theory was correct, compression of the medulla would certainly be followed by immediate and marked symptoms." They are also cases in which there is little or no emaciation, and no consequent sinking of the bones to correspond with supposed cerebral waste.

breast. In doing this, the occiput fell precisely against her arm, as it supported the head; there was a difficulty in the child's laying hold of the nipple, and she attempted to force it into the mouth by pressing this firmly up against the breast. This plainly increased the difficulty, for the pressure of the child up to the breast, by the arm supporting the head, and acting upon the occiput behind, evidently produced a deeper displacement of this bone, and so every effort on the part of the mother, while she thus held the child, only aggravated the trouble.

"Seeing that there was no chance for it to suck in this way, I requested the mother to take her arm from under its head, while I would support it in my hands, gently and firmly compressing the parietal protuberances for five or six minutes, but with no pressure on the occiput; and it sucked with the greatest ease; indeed most ravenously. I then changed the pressure from the parietal to the occipital bone, and instantly the same difficulties occurred as when the head was resting on the mother's arm."

Another fruitful cause, especially of the chronic form of the disease, is the modern baby-carriage. A child is laid in this deep, narrow, coffin-like contrivance, pillow crosswise. The body as well as the head sinks in the middle; the child has no room to turn, and if it could, it would be in imminent danger of smothering from the raised pillow on either side. Arriving home after its jolting and head-jarring expedition, panting and fretful perhaps, it only needs a little improper handling (if the bones are not already dislocated) to inaugurate the disease; refusal of breast follows, then convulsions; a physician arrives, but the cause is not recognized; all sorts of remedies are employed; twitchings, convulsions, and other symptoms continue; finally, from overloading, the delicate blood-vessels give way, or more generally death is caused by an exhaustive diarrhoea. This is no fancy sketch, but an every-day occurrence. I can recall numerous instances, before this subject attracted my attention, that I know now could have been saved by position, when the death certificate recorded "tabes mesenterica," "meningitis," or "cholera infantum." Who cannot recall similar cases, where the little one was perpetually dosed, the symptoms persisting despite everything that could be done, or where perhaps they were relieved, and as the physician supposed, by the potency of the prescription, when probably it resulted from an *accidental proper position*, or after removal from a bath? Dr. Z. T. Sowers, of this city, and Dr. Luck, of Roanoke, Va., inform me that they have seen many such cases. A brother-in-law residing in the latter place, an intelligent, but not a medical man, wrote me a few months ago: "I really think if we had not had our attention called to the subject, that M.'s infant would have fallen a victim thereto. For several days it had many of the symptoms you describe, but the simple means indicated were apparently effective." In a conversation with Dr. John B. Hamilton, Surgeon-General Marine Hospital Service, he said, that when practising in Kane, Greene Co., Ills., in 1872, a child about two years old, of Elias Greene, living in the neighbourhood, had convulsions, which had continued at frequent intervals since birth, produced, it was thought, by deficient ossification of the cranial bones. Dr. A. B. Allen, who attended the case,

placed a *tight bandage around the child's head, and the convulsions, in a few months, entirely ceased*, the bones having become consolidated. Dr. Hamilton's statement was dependent upon the history as given him by Dr. Allen; but it was of common repute that the child was cured by the treatment, Dr. H. himself having attended other members of the family.

Of the many instances that I have lately seen in the incipient stages of the disease, all of which it may be said were controlled, one particularly occurs to my mind, where the mother, after allowing the child's occiput to rest on her arm all night, noticed next morning, among other symptoms, what she called swelling of the feet; this was nothing more than commencing rigidity. The child, plump and healthy, sucked indifferently, threw its head back, all the muscles becoming knotted; it regurgitated half a teaspoonful of water, containing one-twelfth drop tinct. aconite, which the mother insisted produced the spasm that followed. I therefore ordered other "medicine," consisting of chalk and sugar, and remained to see that a *proper position* was carried out. There was no further bad symptom.

Dr. T. N. McLaughlin, now of the Philadelphia Hospital, who gave me valuable assistance in many of these post-mortems, writes me as follows of a case occurring in that institution.

"My attention was called to Mary M., white, æt. 4 days. The mother stated that the child was very restless, refused to nurse, and she was unable to account for the sudden change in its condition. Upon inquiry, I ascertained from the mother that she was in the habit of resting the back of the child's head upon her arm, and of tossing it while lying in this position in order to quiet it. The child presented the following condition: The expression was one of intense distress. There was marked hyperæmia of the conjunctivæ, delirium, and throwing of the head from side to side. It had a few spasmodic contractions of the muscles, but no convulsion; the pulse was rapid and feeble. The cause being recognized, I immediately resorted to your mode of postural treatment, by placing the child upon a pillow, and on its side, so as to relieve the pressure from the over-riding of the occiput. The relief was almost immediate. The child who was so restless before, now became quiet. This postural treatment was alone tried in order to test its merit, and I feel confident that the child's life was saved by immediately recognizing the cause and removing it."

As before mentioned, in many of the cases examined, I found a reddish gelatinous matter mixed with the coagula enveloping the cord, distributed mostly in the dorsal and lumbar regions. West also refers to its presence around the theca. This may correspond with the viscous mass or proliferation of connective tissue, which, according to Meigs and Pepper, is the constant anatomical lesion found almost exclusively in the gray substance. The condition I have described existed in a lesser degree in an infant that died from asphyxia by being accidentally overlaid. The difference is best shown in the following photomicrographs and report, for which I am indebted to the courtesy of Surgeon General P. S. Wales, U. S. N., and

P. A. Surgeon S. H. Griffith, U. S. N., who so successfully executed them. In the case of asphyxia, it will be observed that the vessels are limited and defined, while the profusion of coagula in the trismus plate is at once striking and conclusive.

Fig. 1.



Capillary vessels in lymph around spinal cord, child 5 weeks old (asphyxia). Magnified 175 diameters.

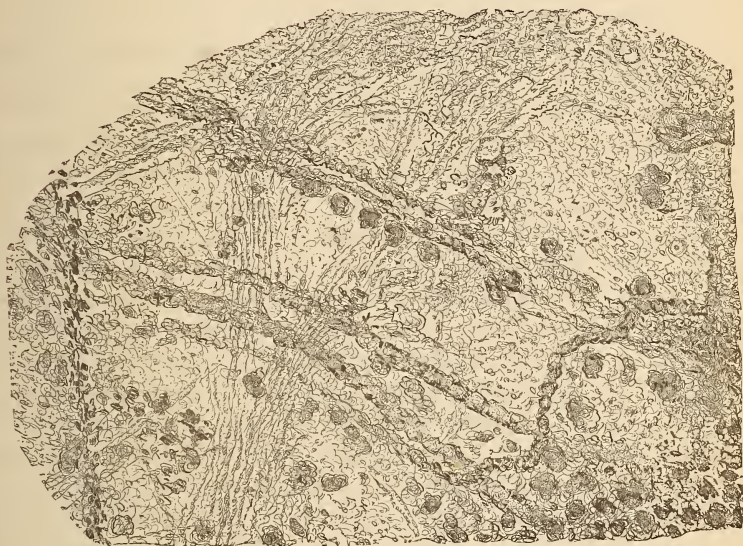
"In reference to the examination of five spinal cords received from Dr. Hartigan, the following report is respectfully submitted: Four of the specimens were from infants who had died of trismus nascentium, and one from an infant who died of asphyxia.

In the cavity of the arachnoid, more or less surrounding the cord in all the cases, was found a varying quantity of reddish gelatinous lymph. In three of the cases of trismus, abundant coagula were found in the same locality, less defined in the other. In the case of asphyxia, no coagula were found. Microscopical examination of the lymph showed it to be organized, containing abundance of capillary bloodvessels, with evidences of congestion observed in microscopic extravasations as well as turgescence of the larger vessels. This condition was found in the case of asphyxia as well as in the cases of trismus; in all the cases the lymph presenting precisely the same appearances, which are shown in the accompanying photomicrographs. No microscopical examination of the cords was made, but they presented the appearances of congestion."

When attention was first called to Dr. Sims's views, the efficacy of a plan so simple and promising such happy results was tested by many physicians. Some saw the patients soon after the first convulsion, and were able to rescue them; while the large majority arrived probably several hours, even days, subsequently, and of course as a rule could not

afford much relief. This is sufficient to account for the rejection of the theory. I myself confess to some disappointment until repeated observations made the cause clear. I found some instances where, on account of deficient ossification, or the looseness referred to, the symptoms were

Fig. 2.



Capillary bloodvessels in lymph around spinal cord, with coagula on right side, upper portion. Case of trismus nascentium, 8 days old. Magnified 160 diameters.

precipitated during or shortly after delivery, death following in a few hours. These fortunately constitute a very small percentage, and are probably attended by contusion of the medulla oblongata. They are not altogether hopeless, however, for sometimes death may be averted with proper manipulation, and, if necessary, tracheotomy. When the disease occurs later, and the patient is seen on the eve or shortly after the first convulsion, in other words, during the stage of congestion, progress can be arrested, as is amply shown in Dr. McLaughlin's case.

It is not always necessary to the development of the disease that displacement should be marked or visible. In either case, from continued decubitus, unpleasant symptoms may arise, which subside when the child is taken up—the pressure being thereby relieved—only, however, to recur when the infant is again laid down.

The fact that the post-mortem appearances are not uniform was advanced by Dr. Baldwin as irreconcilable with Dr. Sims's views of the pathology of the disease. As has been already shown, this is accounted for by the many who die of asphyxia, from severity of the paroxysms, and consequent congestion of the lungs, before there is time for extrava-

sation. The post-mortem appearances, therefore, and the duration of the disease and its symptoms, really depend upon the degree of pressure, from the slightest to the greatest possible, modified or intensified by its intermittent or persistent nature.

Another class remains to be mentioned, in which *position* alone cannot rectify the displacement. This either depends upon too great ossification and consequent impaction, or the apex of the occiput is dislocated or curved inwards. Here a surgical operation becomes necessary. Cases XXVI. and XXXI. are examples. Such cases would require the most diligent manipulation and attention to afford a chance of success; indeed. I do not know that any contrivance could be devised to retain the incurved apex *in situ*. Dr. Sims reports a case where he punched the scalp with a shoemaker's awl, and with the edge of the parietal as a fulcrum endeavoured to pry out the bone, but he did not succeed. He then followed the plan of Dr. Harrison, and cut down on each side of the lambdoidal suture; and with the flat end of a probe on one side and a director on the other he pushed out the edges of the occiput. The effect was satisfactory, all the urgent symptoms becoming modified, but they would instantly return by letting the bone fall back. Although permanent good was impracticable, the result showed clearly that the symptoms were dependent upon mechanical pressure. The only case of this kind that I saw before death was through the kindness of Dr. Smith Townshend, health officer; the patient was moribund. After cutting through the lambdoidal suture I pried the bone out; a marked mitigation of symptoms immediately followed. There were no means to hold it in position, but the child lived till the next day. At the examination of the head no effusion was found to have followed the operation, and it was with difficulty the opening in the commissure could be found.

The operation that Dr. Harrison successfully performed was for depression and impaction of one side. Dr. Hart performed a similar operation, and forced the occipital bone back to its place. The child had one convulsion and recovered; it was kept reposing on either side. In such cases I believe there is every assurance of success when performed upon early; but where the incurved apex cannot be rectified, the child is then born but to die, the symptoms being generally manifest soon after birth.

Drs. Wilhite and Bryson compared the effect of a spicula in the adult to the pressure of the occiput in the infant. Now, while the results are the same by relieving such pressure, it will be apparent that the effects on the infant are more profound, for instead of local irritation we have contusion at the *fons et origo*, or base of the brain. That such effects are not confined to the human race, is shown from the following striking comparison by Dr. Bryson. "Those who are hunters have noticed, doubtless, in killing a wounded bird by pressure of the thumb upon the

base of the brain, the cry of alarm, the spasm and rigid contraction of the muscles; and if the pressure have not been exerted to a fatal extent, and the thumb be removed, how the rolling of the eyes ceases, the rigidity departs, and the bird seems as well as ever."

The custom of "bouncing" on the arms or lap, for the supposed purpose of quieting the baby, is another evil. Precaution against the disease ought to be observed from birth, by proper instructions to the mother and attendants, and especial care should be taken that the child has a soft feather pillow to lay its head upon when asleep, during nursing, or when carried in the arms or lap. Such article should constitute one of the indispensables of the baby's toilet. This is probably the principal reason there are not more victims of trismus among the better class of people, among whom infants are not allowed to lie upon the back in a narrow crib long enough for injurious effects; among whom, too, they have the attention of well-paid nurses, and the benefit of frequent change of position from the lavish manner in which they are fondled.

The fronto-parietal position, or face looking toward the horizon, is the proper one generally for either occipital depression or overlapping of one side. In all conditions the disease results from a pressure expended at precisely the same point. The less direct and less powerful, as shown, accounts for the chronic form or trismoid.

One more interesting point in this subject is the cause of still-born children, where the cord is not at fault, and when movement has been distinct just before and during a tedious labour. Death cannot occur from asphyxia, because respiration has not set in. What, then, will cause it but prolonged pressure on the brain? In a still-born infant that I saw recently, the incurved thumbs and toes, and general stiffness, attracting my attention, examination showed intense congestion and dotted extravasation of the spine, and posterior part, and base of brain. M. Theln (*Journ. de Chir.*, June, 1844) relates a similar case of a child born dead in a state of tetanic rigidity, but there was no autopsy.

Now, taking into account the mortality in Washington, New Orleans, and other cities, and their proportion of population, it is no exaggeration to say that the whole number who in the United States annually succumb to this disease is 25,000, which, when compared with the population of the globe, and the greater prevalence of the malady, chiefly from ignorance, in the eastern countries, is appalling to contemplate; for it gives a death-rate of more than half a million.

It would be ungrateful before closing this article not to express my acknowledgments again to Dr. D. C. Patterson, Coroner of the District, for his co-operation in prosecuting these investigations. To Dr. Smith Townshend, Health Officer, for much kindness and many favours. To Surgeon A. A. Hoehling, U. S. Navy, and Dr. D. S. Lamb, for translations. To Col. John S. Billings, Surgeon U. S. Army, Librarian of the Surgeon-

General's Office, I am especially indebted for facilities in consulting the unsurpassed collection under his charge.

Thus I place this subject before the profession, earnestly invoking for it the careful consideration its importance demands. To myself it has been an exceedingly interesting study. I have not formed conjectures, and then moulded facts to suit them; but have honestly sought—not without personal sacrifice, and sometimes even personal danger—to accumulate trustworthy information. The whole matter is humbly submitted, believing, as the now lamented Dr. Sims has aptly said, “If I am wrong, cotemporaneous observers will prove it. If I am right, future generations will feel it.”

ARTICLE V.

CLINICAL HISTORY OF A CASE OF RECURRENT DROPSY OF THE LEFT MIDDLE EAR, COMPLICATED, AFTER EIGHT YEARS' DURATION, BY AN ACUTE ATTACK OF MONOCULAR OPTIC NEURITIS (CHOKED-DISK¹) ON THE SAME SIDE, FOLLOWED BY GENERAL TABETIC SYMPTOMS: WITH REMARKS. By CHARLES H. BURNETT, A.M., M.D., Professor of Otology, Philadelphia Poly-clinic and College for Graduates in Medicine, etc., and CHARLES A. OLIVER, A.M., M.D., one of the Ophthalmic Surgeons to St. Mary's Hospital, Philadelphia.

WE have been induced to publish this yet unfinished case, not only on account of its great rarity, but also to make attempts to give answers to the curious and almost anomalous chain of interesting symptoms which have presented themselves from time to time during its study. We are fully aware that all we can say is purely hypothetical, and that the true response to our questionings can be obtained only by actual post-mortem examination; but by the process of exclusion, through careful and repeated clinical research, we think we have arrived at certain data which make the clinical features of sufficient importance to study until that time when nature shall furnish us with an absolute answer.

HISTORY OF AURAL SYMPTOMS.

BY DR. BURNETT.

July 8, 1874. Jacob R. Yeager, aged fifty-five years, a furnace-maker, single, of a lean and rather sallow appearance, makes the following statement: “At the age of eight years operated upon at the Pennsylvania Hospital by Dr. McClellan for a polypus in his right ear. After considerable cutting and cauterizing, the polypus disappeared. Since that time there has never been any hearing in the right ear.”

¹ I use the term “choked-disk” to signify a choking of the intra-ocular tip of the optic nerve by serous extravasation into its subvaginal space. (Dr. Oliver.)

Inspection of this ear reveals a very shallow external auditory canal not more than two-thirds of the normal depth, at the bottom of which is no sign of a membrana tympani, but simply movable integument over bone. A paracentesis knife or a needle run through the fundus of the auditory canal until it strikes bone causes no pain. The integument in the place of the drum-membrane moves under the pneumatic speculum of Sigle. There are no traces of any ossicles of hearing. The tuning-fork, vibrating on the vertex, is heard better in the right ear than in the left, and the patient feels air enter the right tympanum, when he inflates the Eustachian tube, by Valsalva's method. It seems probable that the old cauterization in this auditory canal for the cure of a polypus stimulated excessive granulations, which, becoming organized, were allowed to close up the auditory canal and obliterate this ear. It may also be inferred that in this man there is a tendency to aural disease, probably of a catarrhal nature. His health is good; he is a strong man, and has been a hard worker in his trade all his life. The patient applies now, however, for relief from hardness of hearing in his good ear, the left. The membrana tympani on this side is opaque, lustreless, white, and flat, although the malleus is retracted.

Hearing for the watch $\frac{4 \text{ in.}}{60 \text{ ft.}}$. Politzer's inflator makes no impression on the ear, but the catheter increases the hearing to $\frac{15 \text{ in.}}{60 \text{ ft.}}$. This, however, is not a permanent relief, as the patient states on July 20. He has been catheterized before by another surgeon, but with the same result, viz., improvement for a few days; then recession of hearing.

31st. The improvement gained by the catheter at last visit, four days previous, remains. Hearing for large watch, on left side, $\frac{15 \text{ in.}}{60 \text{ ft.}}$.

August 3. The hearing at this visit $\frac{4 \text{ in.}}{60 \text{ ft.}}$ for the watch. Immediately after catheterizing $\frac{3 \text{ ft.}}{60 \text{ ft.}}$ for the watch.

Sept. 12. Patient complains that there is a "drop of movable fluid" in his left ear. In a reclining position, the hearing becomes suddenly better (two feet for the watch), but when the head is in an upright posture the hearing sinks again (two inches for the watch). This was verified by me, by testing with a watch. Though no bubbles could be detected through the membrana tympani, paracentesis was performed in the lower posterior quadrant, and there escaped a brownish-yellow, transparent fluid when the patient inflated by Valsalva's method. No pain from the operation. Hearing now rose to $\frac{15 \text{ ft.}}{60 \text{ ft.}}$ for the watch; a better hearing than the patient has had for many months.

14th. The patient says that the sensation of the fluid "drop" in his ear has not returned, and in his opinion his hearing is normal.

Jan. 1, 1875. Patient calls to say that his hearing has continued to be good.

March 14. The patient now called to say that he felt the "old drop of fluid" in his ear, and he wished me to perform the paracentesis again. The hearing had sunk again to a few inches for the watch, and the drum-membrane looked flat and white, as it had done before the first paracentesis.

Paracentesis was now performed for a *second* time at the same point in the drum-membrane. Upon Valsalva's inflation, the same yellowish-brown fluid escaped from the opening and ran out at the meatus in quantity, ten to twelve drops. This gave the same relief to the hearing as the first operation. After the incision into the membrane, the latter assumed a bluish tint, and was thrown into delicate radiate rugæ.

23d. The incised spot healed quickly in a few hours on the 14th instant, as he ceased to be able to blow air through it by Valsalva's operation; and to-day his ear feels dull, and he desires the membrana tympani incised again. The membrane looks flat and pale. Paracentesis being again performed makes the *third* operation; there escaped the same kind of fluid from the drum-cavity. This gave the usual relief to hearing. The nares and fauces gave evidence at this time of some catarrh. Patient has cold in his head. He is told to come back as soon as his ear begins to fill up again.

April 15. The ear again feeling closed up, the patient presents himself for another operation. Paracentesis for the *fourth* time is performed in the same spot of the drum-membrane, and there escapes the same transparent fluid, perhaps a little deeper in colour this time, with the same relief to hearing.

May 8. Patient states that his ear is again deaf. He cannot relieve it by self-inflation; nor has he ever been able to do it. A *fifth* paracentesis is performed with the same results as heretofore.

19th. The ear continues free from deafness, but as patient thinks he can feel some fluid accumulating, the *sixth* paracentesis is performed, but no fluid escapes. The membrana tympani heals in a few hours.

Sept. 7. The patient complains again of the same filling of his ear, paracentesis is performed for the *seventh* time, with the same escape of fluid as at previous operations.

Oct. 26. Again the same old aural symptoms necessitate the paracentesis for the *eighth* time, with the same results.

Nov. 24. A similar noting of symptoms in case-book, with a note of the *ninth* paracentesis.

Jan. 3, 1876. Again the aural symptoms, a *tenth* paracentesis, and the usual flow of transparent, yellow-brown fluid, and the return of hearing. There are no signs of naso-pharyngeal catarrh.¹

Feb. 19. Patient comes again with his ear "stopped up." He is in good health, and hopes to serve in the police force on Centennial Exhibition grounds. The membrana tympani preserves the same rather negative appearances, *i. e.*, not indicating presence of fluid behind it. Yet guided by a knowledge of its appearance on previous occasions when fluid was behind it, and also by the patient's feeling, paracentesis for the *eleventh* time is performed. A quantity smaller than usual of the same kind of pale, tea-coloured fluid escapes through the puncture in the drum-head by Valsalva's inflation, with perhaps less relief to the patient's sensations of the presence of fluid. This operation gave relief until March 28. On this occasion the membrana tympani showed a brownish-purple colour. The hearing had become dull, and the ear felt "stopped up." No form of inflation relieved the symptoms. A *twelfth* perforation of the membrana tympani, at the same place, the lower posterior quadrant, gave vent

¹ To this point I have described the case on pages 429-432 in my Treatise on the Ear, 1877, Philadelphia, 8vo. pp. 615.

to* the usual kind of fluid, and effected a return of hearing. After the perforation and inflation, the membrane became more of a normal bluish-pearl colour.

April 8. There is a reaccumulation of fluid in the tympanic cavity. The patient feels at this time the movable drop of fluid in his ear. The *thirteenth* paracentesis is performed, followed by the escape of the same kind of fluid, and the usual relief to his hardness of hearing.

24th. A similar condition of the ear, the *fourteenth* paracentesis, and relief of symptoms.

May 17. A similar note, with a *fifteenth* paracentesis, and the same discharge and relief.

June 20. The same note, with a *sixteenth* operation.

Aug. 23. Similar note, with a *seventeenth* paracentesis. It should be stated that the patient is obliged to be out at night, and in all weathers as policeman at the centennial grounds.

Oct. 23. Same notes, with the *eighteenth* paracentesis, in the same spot; lower posterior quadrant of the drum-head.

Dec. 27. A similar note, and the *nineteenth* paracentesis.

Feb. 6, 1877. A similar note, and the *twentieth* paracentesis. There are no pharyngeal or nasal symptoms to account for the reaccumulation.

March 27. The same condition of the ear, and the *twenty-first* operation for relief is performed.

May 11. A similar note, and the *twenty-second* paracentesis is performed.

The patient was not seen for a long interval, not until January 25, 1878. He states that for four months past, his ear has been growing duller or "filling up," as he says, and that the sensation of distension has at last become painful. The membrana tympana reveals symptoms in no way different from those usually seen when the patient has presented himself for operation. The hearing is very much reduced; the voice being heard only a foot. I performed paracentesis, the *twenty-third* time, at the lower posterior quadrant, the same kind of brownish, tea-coloured transparent fluid escapes from the perforation thus made, and the relief to hearing is as great as ever—the voice being immediately heard normally. This shows that no organic change can have taken place in the conducting apparatus of the middle ear, though the origin of the fluid in the drum-cavity, remains yet obscure.

Feb. 25. The usual "filling up" has occurred again, and a paracentesis, the *twenty-fourth*, gives the usual results of discharge and relief.

July 26. A similar note, and the *twenty-fifth* operation, with relief.

Nov. 29. A similar condition of ear, and a *twenty-sixth* paracentesis, with the usual results.

June 5, 1879. An interval of six months elapses. The patient comes again with the ear "filled up." The *twenty-seventh* paracentesis is performed with the usual favourable results.

Sept. 26. Upon this occasion, bubbles were distinctly seen behind the lower half of the membrana tympani. These moved when the patient inflated by Valsalva's method, but his hearing was in no way relieved by the inflation. At this visit, the *twenty-eighth* paracentesis is performed; not so much fluid as usual escapes, but the hearing returns.

June 15, 1880. A similar note, the *twenty-ninth* operation, and the same results.

Sept. 3. A similar note, with the *thirtieth* paracentesis.

None of the operations have ever been more than simple punctures in the membrane, and have never given any pain.

5th, 1881. Only one recurrence of the symptoms, and only one paracentesis in this year. This made the *thirty-first* operation.

Nov. 6, 1882. The patient states at this time that his left eye has become dimmed in vision, and that his left ear is again stopped up. Paracentesis, the *thirty-second* in the lower hinder quadrant, failed to give relief, because, as I found out later, the fluid required for an exit a perforation in the upper posterior quadrant. Why, I am unable to say (see note of March 27, 1883). Upon this occasion, I sent him to Dr. Charles A. Oliver for ophthalmic examination, whose notes may be consulted for the results he obtained.

Dec. 14. The hearing is found to-day to be three feet for isolated words. The ear feels stopped up, but the membrana tympani looks smooth and fairly normal in colour. The *thirty-third* paracentesis is made, a rather opaque, yellowish fluid escapes, and the hearing thereafter is six feet for same tests as above named. The membrana tympani became very much retracted and thrown into rugæ, and bluish-white in colour, as on March 14, 1875.

Jan. 21, 1883. Patient again feels his ear stopped up. Is rather feeble this winter. The *thirty-fourth* paracentesis is made, and a slightly opaque, yellowish, thin fluid escapes, after which the hearing becomes relatively normal.

30th. A similar condition of ear again noted. The *thirty-fifth* paracentesis is performed, and a thin yellowish fluid escapes. The hearing is made better thereby, but it does not seem now to reach the same high point after the operations as some years ago. The paracentesis leaves no scar on the membrane. The latter heals in a few hours.

March 27. Patient complains that his ear is again "filled up." No bubbles seen behind membrane before paracentesis. The *thirty-sixth* operation is then performed. The membrane seems tougher than usual. Valsalva's inflation forces out a little frothy, brownish fluid, like the usual kind. By this inflation, bubbles are seen moving in the upper and hinder quadrant, but they do not escape through the perforation in the lower posterior quadrant. A second paracentesis was then made in the upper, posterior quadrant, and considerable pale, yellow, thin transparent fluid escaped. Patient says his eye and ear feel better. Hearing for words before the operation, eight inches; after operation, five feet.

In the operation of November 6th, and in that of March 27th, the paracentesis in the lower posterior quadrant did not seem to be adequate for the perfect drainage of the tympanic cavity. Hence in the operation of March 27th, a second puncture was made in upper, posterior quadrant where the bubbles were seen, which could not escape from the first and lower opening, and more fluid escaped from this second upper opening than from the first and lower one.

May 1. The patient complained of a stuffed feeling in his ear, and for the *thirty-seventh* time, the membrana tympani was perforated at the lower posterior quarter; but not a drop of fluid escaped, nor could the patient inflate the drum-cavity by Valsalva's method.

3d. The patient still complains of the stuffed feeling in his ear, and he says he cannot inflate by Valsalva's method. Paracentesis for the *thirty-eighth* time is performed, and a drop of grayish opaque fluid is forced out by Valsalva's method. The case seems to be changing in type, now

appearing to be more like an ordinary case of hypertrophic catarrh of the drum-cavity.

On *June 6th*, the symptoms of deafness being the same, without any evidence of fluid in the drum-cavity, the catheter was used for inflating the left Eustachian tube, since the patient was unable to inflate as he once could by Valsalva's method; but this gave no relief to his deafness or the sensation of fulness in the ear. The patient is evidently weaker; is dizzy when he stoops, and when he walks. The scar made by the perforation of May 3d is still very plainly visible, demonstrating the want of the quick reparative power always heretofore seen in this case.

Aug. 10. The hearing for voice is six inches, only in the left ear. Inflation by Politzer's method increases the hearing to several feet. The tuning-fork vibrating on the vertex is heard best in the right ear, and the voice in the right ear, when words are uttered close to it.

20th. The patient can again easily inflate his ears by Valsalva's method. His hearing is nearly relatively normal, *i. e.*, three or four feet for vocal sounds, and he has no further sensations of filling up of his ear with fluid, the occurrence of which he has learned to recognize. He is just as dizzy as ever, especially when he turns around suddenly. The direction of the turning makes no difference; he may stagger toward either side. Scar of last paracentesis still plainly visible, as a red, scab-like line on the manubrium, near the short process, where it has moved from the lower posterior quadrant of the drum-membrane. The membrana tympani moves easily and plainly under Valsalva's inflation.

Remarks.—There seems to have been a tendency to aural disease in this man, evinced in his childhood, as may be learned by reference to the notes, in which is recorded an account of the existence of a polypus and an operation for its removal, at the age of eight years. This operation obliterated the parts of the organ of hearing usually visible through the speculum, and has left nothing to compare with the other ear. Hence, all information thus ordinarily derivable by comparison of two ears is lost.

The nature of the disease in the left ear seems to be catarrhal, for, when exposed to influences of air and living, likely to provoke catarrhal symptoms, as in 1876, he was markedly worse, and was obliged to resort to frequent operations of paracentesis for relief. And earlier, at the time of the third paracentesis, he had a severe cold in his head. Then, too, his avocation, that of a furnace or stove-builder, would expose him to influences of heat and cold, likely to provoke a catarrh, and especially an aural catarrh. The frequent restorations of hearing by the operations and escape of fluid are worthy of note. They indicate that the disease lay chiefly in the mucous membrane of the tympanic cavity, and not in the underlying fibrous tissue of the ossicles. Gradually, as the fluid formed more slowly, and in less quantity, and as its escape gave less relief to deafness, it would seem that the mucous membrane had become thicker and drier, and that the case assumed the type of hypertrophic aural catarrh. Other coincidences in favour of the purely catarrhal nature of the ear-disease are that after a paracentesis on May 1, 1883, no fluid escaped from the tympanic cavity, though the ear felt stopped, auto-inflation of the Eustachian tube was im-

possible, and there was no relief to the hardness of hearing. These symptoms of a dry catarrh continued for a month, when the use of the catheter relieved the deafness and other catarrhal symptoms in the ear, but the vertiginous symptoms and the alteration in gait increased. I would say, here, that the only record of a case resembling this in the frequent reaccumulation of fluid in the drum-cavity after repeated paracentesis, is that given by Dr. J. Oscroft Tansley,¹ and called by him Hydro-tympanum.

It is worthy of note that the patient's sensations first drew attention to the fact that movable fluid was in his tympanic cavity. Bubbles were rarely seen in the course of eight years, and not at all until many operations had been performed on the membrana tympani. Before a paracentesis, when fluid was in the tympanic cavity, the membrane of the drum looked lighter in colour, flatter and smoother than after the paracentesis. It then assumed a darker hue, and appeared sometimes thrown into rugæ. If the fluid were allowed to remain some time after it had accumulated, it gave rise to a sense of distension and pain in the ear. After such long retentions, rugæ were most likely to appear. The paracenteses never made a permanent scar on the membrane until the thirty-seventh or thirty-eighth operation. Then, with an apparent change in type in the ear-disease, the reparative power of the membrane seemed impaired to an extent which seemed to make the disappearance of the scar slow; but the drum closed as quickly as ever.

The colour of the fluid which escaped from the drum-cavity after the various paracenteses resembled that seen by me in other cases of undoubted closure of the Eustachian tube, in which Valsalva's form of auto-inflation was impossible. As in this case, Valsalva's inflation was usually very easily performed, and as there was every evidence that the fluid in the drum-cavity never escaped by the Eustachian tube into the fauces, the thought naturally suggests itself that in this man's Eustachian tube there must have been a valve-like fold of mucous membrane or a small gland or follicle, extending across the calibre of the tube, and acting like a valve, opening only towards the tympanum, thus permitting *air* to enter the cavity, but preventing the escape of fluid from it in an opposite direction towards the fauces.

The tuning-fork vibrating on the vertex was heard best in the right ear, because, as has been shown, it was more obstructed than the left ear, in its external auditory canal and tympanum, by organized granulation-tissue. This phenomenon, therefore, cannot be adduced in proof that the disease in the left ear is central in origin. In fact, the gradual improvement of late, and the now relatively normal condition in all respects of the left ear, in a subject presenting an increase in vertigo and alterations in gait, tend to dissociate the aural from the latter symptoms. The latter, rather than being ascribable to ear-disease, seem to be tabetic in origin.

¹ Archives of Clinical Surgery, 1878, p. 63.

OPHTHALMIC AND TABETIC SYMPTOMS.

BY DR. OLIVER.

On the 6th of November, 1882, I received a note from Dr. Charles H. Burnett, asking me to examine Mr. Yeager's eyes. The patient, a very intelligent man, gave me the following history: He had been wearing glasses for near-work for ten or fifteen years; had had several changes; last pair for four years, never having had any trouble with them. Never any ocular pain or headache. Three days previous, he accidentally discovered that he was unable to see with his left eye: sure that he never had any trouble with this eye before; in fact, he always considered it as good and as useful as the other. Upon examination, I found the conjunctival mucous membranes pallid. Commencing arcus senilis. An irregular, almost central, superficial nebula in the left cornea. Slight shallowing of the anterior chamber of the same eye. Irides light-blue, and freely mobile. Both pupils normal in size and shape. Tn. O. D. V. = $\frac{6}{\text{xxiv}}$.

With S. 1 D. V. = $\frac{6}{\text{vi}}$. With S. 3 D. read Sn. 0.5 D. from thirty-five centimetres to fifty-six centimetres. O. S. Light¹ perception in all parts of the visual field; vision dazzling, and reminded him of innumerable yellowish points on a blue ground. No obtainable accommodation.

Ophthalmoscopic examinations showed in right eye: Media clear. Disk irregularly round, about seven diameters in apparent size. Exceedingly dirty red-gray in tint—not excavated or prominent. Scleral ring visible both in and out, although probably continuous around the entire disk, being hidden at the superior and inferior edges by coarse retinal striation. Trace of conus to the nasal side of the disk beyond the scleral ring; whilst to the lower temporal margin of the disk there was a long black pigment massing. Retinal arteries and veins normal in proportionate size, calibre, and colour. No visible splotches or hemorrhages. H. between 1 and 2 D. The ophthalmoscopic examination of the left eye, made by the aid of an instillation of the one-fortieth of a grain of hydrobromate of homatropine, causing even an almost full pupillary dilatation, revealed a far different picture. Region of disk exceedingly swollen, the summit being about 2 D. in advance of the normal portion of the retinal plane, which was equivalent to about 1 to 2 D. The sides of the swelling gradually and evenly sloped in all directions to the irregularly swollen retina; its general outline vertical oval, about eight by ten diameters in size, and its colour almost identical with that of the other eye. The edges of the disk nowhere visible; their position being judged by the situation of the retinal vessels and swollen tissue. Entrance of vessels invisible, being concealed in the substance of the swelling. The principal upper and lower venous trunks enlarged and tortuous, dipping into the swollen retina; several tissues losing themselves by short, deep curves, before regaining their normal calibre and proper course, about twelve to fifteen millimetres beyond the summit of the swelling, where the retina assumed its proper level. Arteries first seen at the base of the swelling as very contracted, tortuous, blood-bearing streaks accompanied in many instances by opaci-

¹ Diffuse reflected sunlight of sufficient power to give $\frac{6}{\text{iv}}$ vision for form.

ties of their lymph-sheaths. Numerous feathery masses of fresh hemorrhagic extravasation in the fibre layer of the retina, especially following the vascular distribution. In the primary bifurcation of the upper temporal division of the central retinal vein, there was a long flame-shaped hemorrhage. Immediately in the macular region could be seen a large irregular hemorrhagic mass, seemingly completely surrounding the fovea, but yet the annular yellowish reflex of the rim of the macula could still be vaguely seen. No visible choroidal changes. Media clear, with the exception of the cornea.

Upon further questioning him, I found that for the past year he had been making a great deal of water, especially at night. By indirect questions, no history of syphilis could be gotten: the patient did not present any external evidences of it. Never had been seriously sick, or suffered any injury. Never used tobacco, or stimulants of any kind. Family history good.

Central colour-perception taken at a distance of five metres.¹

O. D.		O. S.
Red first seen at four millimetres exposure.		Unable to see anything but candle-light; appearing as a dull diffuse, sometimes brilliant yellowish body.
Green	{ Seen as blue at ten mm. Green at twenty mm. Reddish at twelve mm.	
Violet	{ Pink at twenty-eight mm. Violet at forty-nine mm.	
Blue	{ Seen as green at fifteen mm. Blue at thirty-two mm.	

Thus approximately giving in the right eye a central colour-sense power, at five metres distance, of one-half vision each for red, green, and violet; and one-fourth for blue.²

The amount of colour-vision in the left eye could not be obtained, as it was reduced to a mere sensation of yellowish light.

Fields of vision were now accurately taken:³ That of the right eye for form, white, blue and red were found slightly but equally contracted in the order given. No indentations (except that caused by the patient's prominent nasal bridge) or interruptions found, although carefully looked for. In the left eye, with candle-light fixation, light perception obtained by the motion of a second candle-light, was equal in all meridians except to the extreme temporal and nasal sides in the horizontal meridian, where, in sectors each of about thirty degrees, the movable light faded and became nearly lost. No scotomata. With his right eye, he matched Holmgren's skeins of worsted correctly, but slow in determination: With his left eye, the different colours appeared as mere shadings and gradings of "dirty-grays."

¹ For description of instrument used, see Archives of Ophth., vol. x. No. 4, December, 1881.

² See method of experiments by the writer for the determination of a normal standard of colour-sense in the Archives of Ophthalmology, vol. xi. No. 1, March, 1882.

³ One centimetre square each of unglazed white, blue, and red paper pasted on slips of dead-black cardboard, were carried inwards towards the fixation point, situated thirty centimetres' distance from the eye.

I had him return, on the following day, with a specimen of his early morning's urine. This I found to be amber-coloured, transparent, with no sediment; specific gravity 1018; acid reaction; no albumen or sugar. Microscopically; no tube-casts of any description, although several slides were successively ploughed over and over, merely showing a few oxalate of lime crystals. I then ordered for him two pairs of convex spherical lenses. 1 D. for distance, and 3 D. for near work. No general treatment. To report at stated intervals, so that I might watch and study the passing symptoms.

Dec. 14. Returned, saying that the sight of his left eye had been gradually increasing for the past two weeks, but curiously, he noticed at the same time, that his left ear began to feel full, and hearing had been proportionately deteriorating. His expression, "the water has left my eye, and gone back to my ear," was very emphatic. It had become so bad that he had visited Dr. Burnett early in the morning, and had had paracentesis of the left tympanic membrane performed, evacuating a quantity of fluid.¹ The appearance of the blue field studded with brilliant points also ceased about two weeks ago. Had had a great deal of dizziness. Vision and accommodation of the right eye the same. O. S. V. = $\frac{6}{\text{LX}}$ (centric): With S. 1 D. V. = $\frac{6}{\text{XXX}}$ (centric): With S. 3 D., Sn. 0.50 not read, but clearest from forty-five centimetres to fifty centimetres.

Urine re-examined; amber colour and transparent. Sp. gr. 1017. Chemically: Acid reaction; no albumen or sugar. Microscopically: A few oxalate of lime crystals; no animal debris with the exception of a few epithelial scales.

Thirty minutes after tapping of left drum-head, ophthalmoscope showed (without the use of a mydriatic) that the nerve of the right eye had still the same dirty red-gray appearance. In the left eye (pupil partially dilated by homatropine), the edges of the disk were everywhere visible; showing a well-marked scleral ring all around. Disk itself irregularly oval, seven by eight diameters, long axis about one hundred degrees. Exceedingly dirty red-gray in appearance and on the same general level as the fundus; although a few of its most prominent vessels were one-half dioptric in advance. Choroidal ring to the nasal side. Retinal arteries diminished in calibre. About two disks' diameter below the disk there were some small irregular blood masses in the fibre-layers of the retina, in close proximity to the lower retinal vein. The large irregular flame-shaped hemorrhage situated in the primary bifurcation of the upper temporal vein was still *in situ*, although less plainly marked, as it was undergoing absorption, especially at its edges. On the upper side of the lower outer branch of the lower temporal artery, there was a small absorbing hemorrhage. Macular region occupied by a grouping of irregular yellowish-brown bodies, each about the size of a pin's head, looking like partially absorbed hemorrhages undergoing fatty degeneration. Fovea still dimly seen. About a disk's diameter to the temporal side of the macular region, there were two large irregular hemorrhagic extravasations (not fresh) each about one-sixth the size of the disk; whilst about a disk's diameter beneath these, there were several small absorbing masses.

¹ See note in Aural Report.

Central colour-perception (with S. 1 D.) at five metres.

O. S. ¹		O. D.	
Red	Very dark spot of fire at twelve mm. exposure.	Red first seen at five mm. exposure.	
	Pink tinge at thirty-seven mm.		
	Pink at forty-eight mm.		
Green	Deep pink, sixty-seven to ninety mm.	Green	{ Light-blue at sixteen mm.
	Spark of fire at six mm.		{ Green at fifty-three mm.
	Sky-blue, sixty to ninety mm.		
Violet	Dark spot of fire at twenty-one mm.	Violet	{ Reddish at six mm.
	Dark pink with a yellowish cast ² at ninety mm.		{ Violet at twenty-three mm.
	Blue spark of fire at twelve mm.		
Blue	Blue cast at fifty-five mm.	Blue	{ Green at eleven mm.
	Dark blue, eighty-four to ninety mm.		{ Dark green at eighteen mm.
			{ Blue at twenty-nine mm.

Both "patellar-tendon" reflexes exaggerated; but more markedly so on left side. The kick was readily produced by gentle percussion on the belly of the muscle.³

Dec. 15. Visual fields of right eye taken, and found to be about the same as at last examination.

18th. Physical exploration gave absence of any pulmonary, cardiac, or hepatic trouble. Radial pulses, eighty-four. Ophthalmoscope showed same condition of left optic nerve and retina as at last visit. Macular region of right eye intact.

Visual fields of the left eye were now obtainable, and, being carefully taken, gave some interesting results: One centimetre square of white, first seen in all directions from sixteen to twenty degrees from fixation point. Same size blue seen at fixation point, and extending out as a good blue about five to eight degrees in all meridians, and then becoming lighter and lighter until lost at about twelve to sixteen degrees. One centimetre square of yellow, first seen as yellow in all directions from fixation point, for from six to eight degrees: Whilst red (invariably called light pink), seen only from two and a half to five degrees in all directions from fixation. The general outline of all these fields being vertical ellipses, the macular fixation being situated at the bisection of the two principal foci. No scotomata or interruptions.

Jan. 2, 1883. O. S. S. 1 D. V. = $\frac{6}{XXIV}$. Patient asserted that for the past week his left ear had been getting deaf. Thinking that some light might be thrown upon the case, I determined to examine the condition and power of the optic nerve immediately before and after paracentesis; but no observable changes could be seen, or any loss or gain in vision for form or colour could be made out. I found the edges of the left disk every-

¹ Tried diseased eye first, telling patient I had a new card of colour, thus endeavouring through want of previous knowledge to obtain more accurate results.

² See Archives of Ophthalmology, vol. xi. p. 69.

³ The belly-tap kick, I think, is a fair indication of exaggeration of the reflex.

where visible, and the retinal hemorrhages undergoing absorption; the flame-shaped one presenting a granular appearance. The macular extravasation was still to be seen, but not so marked as at last examination.

16th. O.S. V. = $\frac{6}{\text{LX}}$: S. 1 D. V. = $\frac{6}{\text{XXIV}}$? : S. 3 D. Sn. 1.25 clearest (not read) at about thirty-seven centimetres. Ophthalmoscope showed the disk's edges everywhere visible. Retinal hemorrhages fast absorbing. Disk presenting a "filled-in" appearance.

30th. O.D. vision and accommodation the same. O.S. S. 1 D. V. = $\frac{6}{\text{XIX}}$: S. 3 D. Sn. 1.25 clearest (not read) at about thirty-seven centimetres (before and after tapping). Ophthalmoscope showed both of the nerves in the same condition as at last visit (before and after tapping). Complained of two attacks of twitching of the facial muscle of the left side, each lasting for four or five minutes.

Feb. 13. Vision of left eye with S. 1 D. = $\frac{6}{\text{XV}}$. Able to spell words of Sn. 125 with S. 3 D. at fifteen centimetres.

27th. O.S. eye-ground much clearer; no new changes. The extravasations fast disappearing. At this time, form-vision of left eye reached $\frac{6}{\text{XII}}$? Accommodation about the same as at last visit.

March 13. Vision of left eye again failing; S. 1 D. V. = $\frac{6}{\text{XIX}}$. Accommodation about the same. Eye-grounds still appear the same. R. Collyr. acidi boracici gr. xvj ad f $\frac{3}{4}$ j, for slight attack of catarrhal conjunctivitis.

27th. O.S. S. 1 D. V. = $\frac{6}{\text{XIX}}$: With S. 3 D. Sn. 0.50 clearest (not read) from twenty-eight centimetres to forty-eight centimetres. Eye-grounds the same as at last visit.

April 10. Vision and nerves of left eye the same. "Patellar-tendon" reflex still increased on left side, but the exaggeration in both contractions not so marked as during previous examination. Opportunity now presented itself by which I was able not only to obtain an accurate record of the exact amount of colour-blindness of the left eye during its post-neuritic stage, that is, its passage into atrophy; but to actually preserve and permanently keep examples of the colour-changes for future comparison, both for myself and all those who are interested in the subject. This I did by means of a Radde's colour-scale.¹ In number one test (green) of Holmgren; with his left eye he matched two wools equivalent to letter r of

¹ Published by the "Société Sténochromique," of Paris. It consists of a long quadrangular piece of muslin upon which are forty-four strips of cardboard pasted side by side. The first strip has the so-called "index" on it—a vertical row of thirty-one "rainbow-colours," commencing with cinnabar and terminating with carmine, followed by eleven more strips, these latter being examples of the principal colours mixed with gray, each colour being numbered. The next strip has the verbal expression of each index-colour situated on a level with the colour itself. Now follow forty-two strips, each having an index-colour about the middle of the strip, from which twenty lettered shades and tones successively rise and fall, so that by the time the end of the table is reached, we will have had over eight hundred and fifty colours, each graded and registered in its proper place.

number five strip, and letter q of number thirty-two strip of the scale. Letter r of number thirty-five of the scale was the exact equivalent of the wool selected as being the nearest match to the rose tint; whilst letter q of number twenty was the counterpart of the wool chosen in the number three or control test. I tested still further for confirmation, and found that the letter i of number twenty was the colour of the wool chosen as nearest to pure blue (letter i of nineteen). Yellow vision was good.¹ No evidence of any colour-blindness found in the right eye, even after repeated examination.²

May 1. Vision of both eyes same as at last visit. Ophthalmoscope showed that the left nerve was becoming grayer. Retinal arteries and veins as before. Von Graefe's tapping-test³ gave negative results. No cranial bruit heard. Left "patellar-tendon" reflex was still increased, although reflex diminishing.

15th. Complained of a heavy pressure in frontal region, there being no difference in its intensity on either side. Said he had been getting dizzy when he walked, whilst eyes were closed. Left "patellar-tendon" reflex still the greater, but both diminished. O. D. S. 1 D. V. = $\frac{6}{VI}$. O. S. S. 1

D. V. = $\frac{6}{XIX}$. Asserted that taste was perfectly good, but that smell was not. This he had noticed for the past twenty years, dependent, he thought, upon his left nostril not being so free. No subjective sensations of smell. I tested him, and found smell deficient with his left nostril, although canals perfectly free, and mucous membranes identical. Patient able to eject air through his two nostrils with equal force against his hand. Ophthalmoscopic examination of the left eye showed that its disk's edges were everywhere visible. Commencing excavation. Merely few pigment stains where previous hemorrhages existed. No new extravasations. No change in calibre of bloodvessels or colour of current from that of last examination.

31st. Such marked changes had occurred in the left eye that I instilled the one-fortieth of a grain of hydrobromate of homatropine for more extended examination. Ophthalmoscope showed that the disk was deeply excavated into the lamina cribrosa, the excavation being large, and shelving almost directly up to scleral ring. Retinal arteries and veins were diminished in calibre, both in proportion to their previous condition, and the coexistent size of the retinal vessels of the other eye, especially the arteries, which were being rapidly reduced to mere threads. Colour of the venous current more nearly normal, with less tapering of vessel walls as they entered the optic nerve. Nerve itself had a comparatively grayer hue, and was less capillary than its fellow. The hemorrhage in the pri-

¹ The use of Radde's scale in this connection was first hinted at by Geissler in "Schmidt's Jahrb.," Bd. 191, s. 92, but, as far as the writer knows, no attempts to methodize its employment have ever been made.

² It may be worth while noting that after the writer had selected the proper strip in Radde's scale to place the chosen colour in, the patient himself was made the one to compare the selected wool with the nearest changes, he being more able, by reason of his acquired power of differentiating shades, to give the exact intensity, and hence the proper letter.

³ Sharply tapping the cranial vault with the finger: Von Gräfe asserted that the position of a cerebral tumour may sometimes be ascertained by this method; the tap causing acute pain at the point of the morbid growth. "Kl. Monatsbl.," 1863, S. 3.

mary bifurcation of the upper temporal vein was entirely absorbed, allowing clear retina to be seen; but the upper macular branch had some pigment degeneration situated near it, in the position of the previous extravasation. All traces of smaller hemorrhages in the inferior portion of the retina had disappeared. The lower edge of the rim of the fovea centralis was still seen as a crescent, but in and above it were some unabsorbed masses, near a small macular twig of the lower temporal vein.

Quinine tasted the same on both halves of the posterior portion of the dorsal surface of the tongue. Ether and iodoform more plainly smelt with right nostril. Egress of expulsed air equally free on both sides. Radial and carotid pulses equal in volume, strength, and rapidity (eighty beats per minute, comparatively full and strong for time of life). O.S. 1 D.

$$V. = \frac{6}{XIX}$$

June 14. O.D. S. 1 D. $V. = \frac{6}{VI}$ O.S. S. 1 D. $V. = \frac{6}{XXX}$. Visual

fields again taken. Those of the right eye were somewhat concentrically contracted; the red field being about two-thirds its previous size. Those of the left, although continuing of the same general form, were only about two-thirds their former size. Red still called pink, but curiously only so at the periphery: The patient persisted that the colour became a "dirty-brown" when it had reached fixation point. Amount of colour-blindness obtained by means of the wools and scale gave the following results: With right eye wools sorted and matched correctly. In the green test, with left eye, he matched a skein equivalent to letter n of number twenty-two strip. In the rose test, letter n of number four strip. In the control test, letter q of number twenty-four. For the nearest to blue, he selected a wool corresponding to i of nineteen; whilst with yellow v of number forty-two was the match.

Central colour-perception at five metres.

O. S.		O. D.	
Red	<ul style="list-style-type: none"> "Light pink fire" at thirty-two mm. exposure. Darker at fifty-four mm. "Lead colour" at ninety mm. Dark spark of fire at fourteen mm. 	Red	first seen at five mm. exposure.
Green	<ul style="list-style-type: none"> Brighter at twenty-five mm. Lighter and brighter, forty-eight to ninety. 	Green	<ul style="list-style-type: none"> Blue at six mm. Green at forty-two mm.
Violet	<ul style="list-style-type: none"> Yellow spark of fire at twenty-six mm. Lilac, eighty-four to ninety mm. 	Violet	<ul style="list-style-type: none"> Yellow at six mm. Violet at thirty-six mm.
Blue	<ul style="list-style-type: none"> Dull spot of fire at thirty-two mm. Brighter, fifty-five to ninety mm. Bright blaze of fire at twelve mm. Brighter at twenty-two mm. 	Blue	<ul style="list-style-type: none"> Green at twelve mm. Blue at forty-two mm.
Yellow	<ul style="list-style-type: none"> Brighter with a blue tinge at forty-four mm. Blue tinge gone, very pale lemon colour, at seventy-two to ninety mm. 	Yellow	first seen as yellow at twenty-five mm.

28th. O. D. S. 1 D. V. = $\frac{6}{\text{VII}}$. S. 3 D. showed a slight increase in pres-

byopia, "ρ" being removed about three inches. O. S. S. 1 D. V. = $\frac{6}{\text{XXX}}??$.

Left "patellar-tendon" reflex still the more.

July 12. Vision remained the same. Said that he had not had any twitching of the muscles of the face. Voluntarily told me that he had lately noticed a tendency to stumble sideways whilst walking, and that his left knee gave out upon going up stairs. Tendency to sleep. No headache or neuralgia of any kind. No trouble with water. Bowels regular. "Patellar-tendon" reflex on the left side still the more. I spent some time making comparative æsthesiometric experiments, both with blunt and sharp points, in order to see if tactile sensibility was lowered or changed; but, after the most prolonged examination with careful and conscientious endeavours on the part of both the patient and myself, I could not get any departure from what I supposed ought to be considered normal. Contact in relative positions and directions in many places on the two sides of the head, trunk, and limbs failed to show any unilateral derangement of sensibility.

26th. Complained still more of the tendency to stumble sideways, compelling him to throw the other foot to the same side, to keep himself from falling. Asserted that he had "a weight on the top of head," and that he was more disposed to giddiness. No twitching in any muscle. No shooting pains. Said that he continually felt as if he was "walking on something soft," and that he "can't feel tread so much;" although "no difference in the two sides." Gets "tired in walking." Knows "that sight in left eye is failing." Tendency to sleep and drowsiness. Left knee gives way when he attempts to go up and down stairs. Examination showed me that the vision of his eyes remained about the same. Left "patellar-tendon" reflex the more. Incoördination of the lower limbs tested by making him walk in a straight line, without looking at the floor; showing a tendency to throw himself towards the right, when the right foot was being planted, and towards the left when the left foot was being placed on the floor. Said that there was a slight tendency to reel and fall, when I made him attempt to balance the body whilst he was standing erect, with his eyes shut; although to all appearances he stood perfectly still. Muscles of limbs equally developed and well nourished for time of life. Spine not tender to pressure. No history of spontaneous pain in that region. Testing of a few of the superficial reflexes gave me entire absence. Plantar reflexes not tried; cremasteric showed want of testicular contraction; no obtainable contraction, not even stiffening or rigidity of the abdominal, gluteal, and epigastric muscles.

Aug. 9. Still had the subjective sensation of "treading on something soft." Dizziness remained; but he really felt better than at last visit. Vision the same. Pupils normal in size and shape. Irides equally responsive, separately or combined, to both light stimulus and the accommodative act. I instilled the one-fortieth of a grain of sulphate of daturia into the left conjunctival sac, so that I might obtain an accurate ophthalmoscopic view. The disk still presented the same dirty red-gray appearance; the grayness being more marked in the deeper layers. Arteries, veins, and excavation same as at last examinations. All traces of splotches and hemorrhages disappeared. Macular region slightly granular and

irregular. Disk of the right eye dirtier and grayer, although by no means so atrophic as its fellow.

20th. Bright day. Excellent vision for the right eye; reading on a new card, every letter of six dioptric type at six metres distance. Vision of left eye gotten with the same card, at the same distance, showed a haphazard guess at number forty-eight dioptric type. Action of irides as at last visit. Weight on top of head persisted, and ground still felt soft under his feet. "Patellar-tendon" reflexes less than ever, yet the same relative difference existed. Said that he had ceased all sexual desire some five or six years ago.

27th. Vision of right eye the same as at last visit. That of the left had fallen to one-tenth of normal ($\frac{6}{LX}$). I sent him to my friend, Dr. G.

Betton Massey, to see whether there were any discoverable motor derangements. The following is the report: "Muscles of expression of right side of face deficient in motility. Is unable to squint or grin on that side (the patient dates this from the time of the removal of a polypus from the right ear). The grip of both hands is good: Dynamometer, R. 115, L. 115. Has all motion of arms and legs with no apparent diminution of force. Electrical condition of muscles and motor nerves: Face-response to F. C. equally good on both sides. All other muscles and nerves responded well to faradic current, except peroneal nerves, which showed slight diminution on both sides. Galvanic current; normal reaction.—Ka. S. Z. An. S. z.—present in muscles and nerve, which also showed a normal degree of quantitative action.

Remarks.—The want of motility in conjunction with the presence of a good response to faradism, and no degenerative reaction on the right side of face, would at first glance point to centric trouble, but I think this must be excluded when we take into consideration the patient's assertion of the simultaneous occurrence of the stiffness of the right face with the removal of the polypus. Such traumatic cause for the unilateral palsy would naturally suggest a diminution in the faradic response and other evidences of degenerative reaction. Yet such is by no means necessarily the case. An interference with the electrical reactions only occurs in those cases of peripheral palsy where the traumatic cause is of a nature sufficient to impede the proper conduction of trophic influence. Where traumatism falls short of such a degree, the motility may be diminished without change in electrical reactions.

The slight lessening to F. C. in the perineal nerves is not so easily explained; but the absence of degenerative reaction in this situation undoubtedly excludes a peripheral cause."

29th. Again tested colour-blindness. Wools correctly matched with the right eye. In the green test with the left eye, letter t of number seven was the selected equivalent; letter m of number thirty-two was the match in the rose test; letter l of number fourteen was that of the control test; letter u of number forty that of the blue; letter m of number nine that of the yellow.

At this point Dr. Burnett and I agreed to close the case, as we both thought that we had sufficient data to establish a fair and probable solution of the trouble; reserving the later changes for a future paper in which a final report could be embodied with the post-mortem examination, thus showing how much dependence can be placed on the significance of pass-

ing symptoms in the diagnosis of some of the rarer forms of grave and insidious nerve disease.¹

Remarks.—Before going into the discussion of the possibility of any connection between these curious series of phenomena, it will be of value to point out the meaning of a few of the ocular and other changes I have observed during my study of the disease.

Onset and type of the choking of the disk.—It will be remembered that it was sudden and that it was purely unilateral. Upon carefully going over the literature of optic neuritis dependent upon intra-cranial change, excluding orbital disease, external injury,² true fracture, etc., as a cause, I find comparatively few of the uniocular type. Study³ of the combined cases reported by Annuske⁴ and Reich⁵ gives less than seven per cent. of the unilateral form. Gowers, on page 130 of his *Medical Ophthalmoscopy*,⁶ says: "The neuritis of tumours is in most cases double, sometimes equally advanced in the two eyes, often more intense and subsiding earlier in one than in the other. Rarely the affection of the disks is unilateral . . ." Further on⁷ he gives the clinical history of a case of unilateral optic neuritis, and thinks it was as "in most cases in which it is unilateral, on the side opposite to the cerebral lesion." Von Graefe⁸ mentions a case of brain tumour with uniocular choked disk. Dr. J. Hughlings Jackson, in a paper published in the *Royal London Ophth. Hosp. Reports*,⁹ gives two cases of uniocular neuritis from cerebral tumour (one

¹ Whilst reading an account of the illness of Mr. John C. Saunders, author of a posthumous volume entitled "A Treatise on Some Practical Points Relating to the Diseases of the Eye," published in London in 1811, I noted the similarity of his symptoms, although of an aggravated and more pronounced type, to those seen in this case. The monocular changes in both form and colour-vision, with subsequent partial restoration of sensibility. The general motor and sensory disturbances; "he did not always distinctly feel the ground," etc. Then the result of the autopsy, where, although the rest of the brain was healthy and firm, "the dura mater adhered firmly to the inner side of the cranium, especially over the right eye; but it was apparently free from disease. The tunica arachnoidea and pia mater were healthy." This is quite interesting; the situation and position of the adherence confined to the right side over the affected eye; the distinction made between the outer tunic being "apparently free from disease," and the inner two described as "healthy;" the consideration of the fact of the imperfect methods and instruments for research in those days, and the low grade of inflammatory change they had to deal with, all lend great weight to the conclusion of a very chronic pachymeningitis complicated by tabetic changes. The finding of freshly extravasated blood with softening of contiguous brain-substance was but the post-mortem evidence of the immediate cause of his death—apoplexy.

² Hulke, *Royal London Ophthal. Hosp. Reports*, vol. vi. pp. 90–93.

³ Norris, *Phila. Med. Times*, Aug. 30, 1879, p. 565.

⁴ *Arch. f. Ophth.*, Bd. xix. Abth. iii. s. 164.

⁵ *Klin. Monatsbl. f. Augenh.*, Bd. xii. (1874), s. 274.

⁶ *A Manual and Atlas of Medical Ophthalmoscopy.* By W. R. Gowers, M.D., 1879, London, 8vo. pp. 352.

⁷ *Ibid.* pp. 272, 273.

⁸ *Arch. f. Ophth.*, Bd. xii. Abth. ii. s. 100.

⁹ Vol. vii. p. 573, "Observations on Defects of Sight in Diseases of the Nervous System."

having been previously reported by Dr. H. Pagenstecher);¹ Jackson's case being one of left-sided neuritis with left hemiplegia, the autopsy revealing a large tumour in right cerebral hemisphere. Jackson considers the occurrence "very rare," and thinks that the morbid growth is almost always situated on the opposite side from the optic neuritis. This last observation has been partially confirmed by the experiments of Dr. Norris² in injecting fluids through the lower lateral corner of the anterior fontanelle of dead-born and older children, in which he usually succeeded "in filling the subvaginal space of the nerve on the opposite side of the head more completely than that on the same side."

Other cases have been either mentioned or reported by Reich,³ Bouchut,⁴ Wells,⁵ Jeaffreson,⁶ Noyes,⁷ and Pooley.⁸ Field gives⁹ an interesting case of brain-lesion with hemiplegia on the same side and unocular neuritis on the opposite side. In this instance the left eye was the one affected. Careful reading of the second of "Two Cases of Unocular Amaurosis," a paper written in 1866, by Jonathan Hutchinson,¹⁰ causes me to think that it was dependent upon a previous neuritis; yet I give it with no certainty, merely worthy of doubt. He cites, in a previous paper¹¹ contained in volume four of the same journal, the study of a number of amaurotic eyes, in which a few of them, especially cases one, three, and fourteen, may with reason be thought to have been the resultants of consecutive neuritis from nerve-sheath filling. Hulke, in a paper entitled "Cases of Neuritis Optica, Neuro-Retinitis, and Retinitis,"¹² publishes some thirty-nine cases, with remarks; among which several, notably numbers thirteen and fourteen, may be taken as fair examples of the unilateral type of this class. Magnus¹³ and Pieuzal¹⁴ are said to have also reported cases.¹⁵

¹ Roy. Lond. Ophth. Hosp. Reports, vol. vii. (1871), p. 130. "A case of glioma in the left hemisphere, whilst left optic nerve intact."

² Referred to on page 567 of the Phila. Med. Times, Aug. 30, 1879.

³ Klin. Monatsbl. f. Augenh., Bd. xii. (1874), s. 274. Zur Statistik der Neuritis Optica bei intracranialen Tumoren (aus eines Abdh. im militär. Journ. (russisch), Juli, 1874.

⁴ Ophthalmoscopie Médicale, 1876, p. 142. Referred to in Noyes' Treatise.

⁵ A Treatise on the Diseases of the Eye. By J. Soelberg Wells, 1883 (Fourth Amer. ed.), p. 559. No particulars given.

⁶ The Lancet, London, March 8, 1879, p. 329.

⁷ Treatise on Diseases of the Eye, 1881, p. 307. Merely mentioned; no history given.

⁸ Archives of Ophth. and Otol., vol. v. p. 148. Tumour on the same side as neuritis.

⁹ Brain, vol. iv. (1881), p. 247.

¹⁰ Royal Lond. Ophth. Hosp. Reports, vol. v. p. 185.

¹¹ Report on cases of amaurosis from intracranial causes, in which one eye only was affected, p. 235. Vide a series of thirteen cases by same author on pages 316, 320, in volume 9 of same reports.

¹² Royal Lond. Ophth. Hosp. Reports, vol. vi. p. 90.

¹³ Vide p. 307 of A Treatise on the Diseases of the Eye, by Henry D. Noyes, A.M., M.D., 1881, 8vo. pp. 354.

¹⁴ Loc. cit.

¹⁵ See details of a probable case on page 120 of vol. ii. of Tyrell on Diseases of the Eye, London, 1840.

That this case may with propriety be added to the number, I think there cannot be any question, as I saw the patient immediately after the attack, and watched him periodically to the time of this writing, therefore not allowing any passing symptoms to escape; and besides, which is of the utmost importance, there were not and are not any evidences in his good eye of part inflammation. The fact that the arteries and veins are normal in comparative size, calibre, colour, course, and shape; no appearance of pre-existing splotches or hemorrhages; nerve, although exceedingly dirty red-gray, not prominent or depressed; vision for form normal; accommodation fair; peripheral and central colour-perception very good for his time of life; all cause me to throw out the idea of past neuritic inflammation on that side.

There might be many theories given to account for the cause of this one-sided choking, but of all I think but two are in any way tenable.

First: That there is a circumscribed chronic pachymeningitis in the left anterior and middle fossa; idiopathic in type; creeping backwards outwardly; involving a few of the nerve-sheaths at their foramina; producing œdema in their subvagal spaces, with consecutive neuritis and partial atrophy. No selective action for the attack upon the nerve, merely accidental, dependent upon the course of the progress of the disease.

Second: That there is a new growth, very chronic in its development and course, situated in any part of the brain, causing increase in the formation of arachnoidal fluid, with pressure in all directions, and accidental passage of the lymph through a few of the weaker foramina into the nerve-sheaths, producing incomplete choking of the nerve involved, which in some few instances has caused consecutive inflammation with partial atrophy.

Colour-blindness.—By reference to the clinical notes it will be seen that, besides the first, there were two examinations of the left eye made with Holmgren's wools. One, eight months after the choking, and the other, two and a half months later. The first determination showed entire loss of green, with partial perception of red, whilst violet had much of its red thrown out. Blue and yellow both good. The second gave entire absence of green, red, and blue; yellow still faintly persisting. This was dependent upon several conditions. First: The nebula on the cornea, hardly worth mentioning as it would merely dull the intensity of the colour, just as if a normal eye would attempt to appreciate a colour through a slight mist or a light fog. Yet I do mention it to show that it has been taken into account, and was considered of sufficient importance to modify a definite comparison with the opposite organ. Second: Pressure, with consequent tissue degeneration. Third: Sanguineous extravasation in the macular region. Fourth: Deficient blood supply to the retina. Fifth: Subsequent tabetic change.

The study of the loss and changes of colour in the left eye is extremely

important, because they were noted from the beginning, and the different passing phases so accurately defined, that delicate and almost absolutely correct answers were gotten in reference to the degree of absorption of the hemorrhages, and the amount of return of the viability of the damaged nerves. There remained at the acme of the choking nothing but shadings and gradings of grays. (The yellow-blue sensation of light in looking at a white object I am almost convinced was purely subjective, yet not to be too dogmatic in the assertion of positive achromatopsie, I will merely assert xanthokyanopie,¹ as this does not interfere with the study of the case.) The conducting fibres were pressed upon, and the receiving fibres buried under a semi-opaque substance, hence their physiological actions were reduced to a minimum, and almost total annihilation of colour-perception the result; the amount of remaining colour being the exact equivalent of the amount of remaining power. This was the primary acquired colour-blindness, totally different from the secondary acquired colour-blindness dependent upon secondary nerve change through consecutive nerve-tissue inflammation; the former, capable of amelioration, and the latter incurable. All this was the result of the localized pressure upon the nerve with its consecutive atrophy, totally distinct from the tabetic changes which came on later; the nerve having had super-added to its atrophy from pressure and inflammation a true gray degeneration like that in the right optic nerve causing a greater amount of atrophic change, with a proportionate relative lessening of colour-vision.

To save time and space I have combined my study of the grouping of the colour-symptoms into a series of definite conclusions which I think may be applied to all similar cases.²

1. In optic-nerve choking, there is a primary acquired colour-blindness; the amount dependent upon the amount of œdema and its immediate consequences.

2. There is a gain in colour-perception after the occurrence of the primary form of colour-blindness, the amount being directly dependent upon the amount of restoration of physiological ability of the diseased nerve-tissue.

3. There is a secondary acquired colour-blindness, coming on after the

¹ Mauthner's definition of yellow-blue seeing. "Vorträge der Augenheilkunde" von Dr. Ludwig Mauthner, 1879, Heft 4, s. 179. (Farbensinn.)

² The colour-vision of the right eye having merely gotten to the very early stage of dyschromatopsie, I am unable to give any rules from this case as to the order of loss of colour dependent upon the tabetic condition. Erb states that in locomotor ataxia green goes first, then red, finally yellow and blue. Charcot says that the perception of yellow and blue persists in a high degree and for a long time. The fact that this experience of these two observers, in cases of tabes, does not materially differ from my own in the observations made upon the left-sided choking with its atrophy in the case before us, together with the comparative study of the visual fields, makes me think that the order of loss of colour-perception is the same in each form.

intermediate gain, the result of inflammatory tissue change or degeneration which lessens physiological action to an equivalent with the amount of nerve-tissue left.

4. The secondary form is incurable, and either remains stationary, or passes on to total colour-blindness.

5. In both the primary and secondary forms of this variety of acquired colour-blindness, green followed by red is the first colour to go; then blue, and lastly yellow.

6. The gain in colour-perception, after primary acquired colour-blindness, takes the following order: yellow, blue, red, and green.¹

7. Definite conclusions in reference to the amount of physiological power (physical condition) left after the cessation of optic nerve pressure and consecutive inflammation may be gotten by average comparison of a number of similar cases.

8. These conclusions have no bearing upon cases of simple degeneration of the optic nerve, as in this form of the disease; there cannot be any distinction drawn between a primary and a secondary colour-blindness, there being nothing more than a progressive colour diminution, passing through the stage of dyschromatopsie, and terminating in total colour-blindness.

It is very important to note the comparative changes in the extent and kind of the peripheral form and colour vision of the two eyes. The almost utter annihilation in the left eye of form and colour fields; the gradual gain in the amount of area and the number of colours seen; their order of progression; the forms of the fields and their relative sizes, when the nerve had gained its utmost; the secondary contraction, and the final changes in the colours themselves. The contraction of the fields of the good eye, with no change in colour, showed slight, but progressive degeneration.

I shall not enter into the reasons of my expunging all other forms of the cause of these changes than those given, but shall briefly summarize the past and existing conditions, and from these add strength to my previous deductions. In the left eye, the primary reduction to light perception; the intermediate gain, which for yellow and blue came back, in areas and kind, equal to that of the good eye; the area for red, when the nerve was its best, equalling about one-fourth the size of that in the right eye, yet the colour never called anything but pink; green never regained; form field as good and as large as its fellow. The secondary loss, shown by the marked contraction of all of the fields, as compared with that during the intermediate gain; and the change of the pink (red) field to the mixed one, containing a central "dirty-brown." In the right eye, the slow, pro-

¹ See note of a case by Chisholm, Roy. Lond. Oph. Hos. Rep., vol. vi. p. 214.

gressive concentric contraction of the form and all the colour-fields, with no observable changes in the colours themselves.

Careful study of these conditions has led me to a few conclusions:—

1. In optic nerve choking, with subsequent atrophic change, the visual fields for form and colour pass through three distinct phases: first, a primary loss of extent and kind; second, an intermediate gain; third, an ultimate loss.

2. In simple degeneration of the optic nerve, there is merely a diminution in the areas of the form and colour-fields, with decided and definite changes in the colours themselves, from the very beginning.

3. The fields of secondary change from œdema (Stauungs-papilla) are exactly the same as those of any simple degeneration of the optic nerve, provided the tissue change exists in similar places.

4. In every degenerative change (equal in transverse section¹) of the optic nerve fibres situated anterior to the chiasm, there is always a concentric and relative limitation for both the form and colour-fields of the side involved.

5. To have concentric and equal contraction of the visual fields in degeneration of both optic nerves, the degenerative process must involve equally in transverse section both trunks anterior to, or posterior from, the chiasm, or the entire chiasm itself; although these degenerative spots need not occupy similar positions.

The investigations which were pursued with central colour-perception are well worthy of note. Commencing in the left eye with candle-light perception, appearing as a yellowish body at five metres' distance, I found that in three weeks the various colours had partially regained themselves; curiously, first appearing as "sparks of fire." Red perception (always called pink) reduced to one-eighth, as compared with the other eye; green never regained, merely turned blue; violet, designated as pink, with a yellowish cast; blue about as good as its fellow. Yellow not taken at this time. At the third examination made seven months later, I found that there had been a marked decrease; red, which had been a "good pink," had faded to a "light pink fire," becoming darker upon greater exposure, and at last passing into "lead-colour;"

¹ It may be observed that I use the expression "equal in transverse section." This I do intentionally, not meaning equal in any one narrow zone, but that there is, by the time we have reached the intra-ocular tip from the point primarily involved (or *vice versa*), an atrophy equal in all parts of the entire nerve distribution to the retina. Thus, there may be zones and girdles of degeneration, or even insulated scleroses, which, if taken all in all, become evenly distributed across the entire nerve or nerves, and produce equal and concentric narrowing of the visual fields. This reasoning cannot in any way conflict with the researches of either those who hold to partial decussation, or those who believe that the decussation of the optic nerve fibres in the chiasm is complete.

green had lost its blue tinge, appearing as varying "sparks of fire," getting brighter and lighter as more surface was exposed; violet appeared as "a yellow spark of fire," becoming lilac;¹ blue diminished to mere "fire spots;" yellow recognized as "lemon colour." Although central colour-perception was deficient in the patient's right eye at the first visit, there was a gradual lessening of power without any change of colour.

Study of these conditions only adds confirmation to the conclusions arrived at in the researches with the coloured wools and the visual fields; showing that this modified method of examination is absolutely under the same laws as the others, having the same changes, and passing through similar phases. Hence, the former conclusions will also hold good in this series of observations; it being my belief that such experiments serve as indices for the exact estimation of the amount of optic nerve tissue changes.

Smell.—At first sight, this symptom appears to complicate the case, but I think, if careful survey be made of the patient's past history, together with proper appreciation of the existing conditions, we not only tend to lessen its seemingly complex nature, but really add strength to the hypotheses brought forward early in the paper. The patient said that he had noticed difficulty in smelling on the left side for twenty years past, dependent, he thought, upon his left nostril not being so free. That there may have been obstruction in the canal, I in no way deny, and that the defective smell was a mere factor in a chronic catarrh, I do not doubt; but I am positive that when I examined him, and that not only once, but repeatedly, I could not distinguish, as far as I was able to see, any change in the mucous membranes, or a marked difference in the calibre of the canals; and that air was ejected through the left side with the same force as through the right. Not only these facts, but his present recognition of the decided difference in the power of the sense on the two sides, which I confirmed by experiment, all made me seek further for the entire cause of the trouble. The objections that might be brought forward to my thinking the cause of the disorder of smell as intracranial are of little weight, because the two conditions could have been coexistent. The local changes having undergone resolution with restoration of the parts involved to their normal condition and action; whilst the intracranial disease still persisting or forming gave the same loss of physiological actions as heretofore.

We all know that loss of smell may arise from several causes, prominent among these being deformities and inflammation of the nasal appendages themselves, such as acute and chronic thickenings with adhesions of the mucous membrane, polypi, bone lesion or paralysis of some of the super-

¹ This is very curious, yet I give it as expressed by the patient, although I do not think it militates in the least against the order of loss and gain, as he may have seen some of the pink in the violet, and this, combined with his yellow vision, has given him a vague and imperfect impression of lilac.

ficial muscles.¹ These conditions not existing, made me throw out any notion of a peripheral origin as being the entire cause of the unilateral dyosmia. The question, then, resolved itself into a central or an intermediate lesion. Ferrier,² by comparative experiment, places the centres of smell and taste at the tip of the temporo-sphenoidal lobe. Further investigation has shown that the loss of action is on the same side as the intracranial lesion, owing to the non-decussation of the olfactory paths in the anterior commissure. I do not think that there can be a lesion of these centres in this case, because, as far as I can get any history, or am able to investigate, there has not been, and is not any deviation from the normal in the sense of taste, which would have taken place if we accept Ferrier's and the later views upon their relative situations. Therefore, all that is left for us, is the intermediate tract, and here I think we can confidently locate the trouble: Inflammatory thickening of the dura mater on the left side of the cribriform plate, part and parcel of the more extended thickening. Of course, I can conceive of a cerebral tumour producing almost identical one-sided symptoms.

Reflex Movements.—The entire absence of the so-called "Argyll-Robertson phenomenon" is quite interesting, although the existence of a break in the reflex of a tabetic pupil, when exposed to light, is by no means universal. Jackson speaks³ of a case of *tabes dorsalis* of seventeen years' duration, in which this symptom could not be found. Gowers broadly asserts that it "cannot, with all our care, be invariably obtained in persons beyond middle life."⁴ This latter assertion I can but re-echo, having seen two patients with well-developed locomotor ataxia, in whom, with the utmost care and patience, I could not get this symptom. Prof. Erb's statistics show but eighty-four per cent., a little over one-half of these being in the preataxic state. Bramwell⁵ is of the opinion that the involved point is probably situated either in the corpora geniculata, or between them and the reflex centre; the abolition of the reflex being independent of the cord lesion. As far as my own reasoning goes, I cannot see why it should be a necessary factor in all cases; its occurrence being dependent upon the accidental position of the lesion, somewhere in the arc of reflex action to light.

The abolition of the superficial reflexes was probably the result of three causes: the age of the patient; pathological changes connected with de-

¹ The right-sided partial immotility of the facial muscles did not seem to give rise to any of these last symptoms, hence my reason for expunging any probable influence from this phenomenon. Had they existed they would have served as arguments against a peripheral cause for the left-sided diminution of smell.

² *The Functions of the Brain*, 1876, 8vo., pp. 323.

³ *The Ophthalmic Review*, July, 1883, p. 213.

⁴ *Ibid.*, p. 212.

⁵ Pages 223 and 229 of "The Diseases of the Spinal Cord." By Byron Bramwell, 1882, 8vo., pp. 300.

generation of the posterior horns of gray matter; and intracranial disease.

The study which I made of the deep reflexes, more especially that of the "patellar-tendon," is valuable in showing a possible primary excitation of the postero-external columns, in the developmental stage of a tabes dorsalis, more pronounced on the left side; the nerve tubes in the affected part gradually undergoing degeneration equally on both sides, with consequent equal relative diminution of the reflex action. It may be that the unequal exaggeration was partially due to the cerebral lesion, as I am positive, from what little experience I have had, that in cases of unequal optic nerve atrophy, there is often a marked difference in the "patellar-tendon" reflex upon the two sides. Again, the unequal exaggeration in the myotatic contractions may have been wholly the resultant of the intracranial trouble, which, upon the superaddition of the degeneration of the nerve-tubes in the postero-external columns, has become relatively equally diminished.

The other motor and sensory disturbances point towards the double origin of the disease. The isolated incoördination of the external perineal muscles,¹ and the diminished response of their nerves to the faradic current, together with the rapidly diminishing "patellar-tendon" reflex indicate that the greatest degeneration is in the lumbar cord.

GENERAL REMARKS.

We think we can notice four distinct factors of disease, as being the causes of the patient's present condition.

First. The early appearance in life of a polypoid growth in the right ear, which upon being extracted caused obliteration of the right auditory canal, and destruction of the contents of the middle ear. The partial loss of motility of the facial muscles upon the same side took place at the same time through peripheral traumatism; although this was not of sufficient moment to cause interference with their electrical reactions.

Second. A chronic catarrhal inflammation of the left middle ear, of an exceedingly rare and almost unique type. The peculiarity consisting in the formation and the retention of a sero-mucous fluid within the tympanic cavity, which required frequent evacuation; each operation productive of a marked increase in audition. The tendency to the accumulation of the liquid, at last ceasing, with a return of the power of hearing to a relatively normal standard. This was purely local in origin.

Third. This conclusion is divided into two probable conditions, there not being any proof of an individual or a combined existence.

A. A chronic pachymeningitis, limited to the anterior two-thirds of the left base, involving a few of the nerve-sheaths at their foramina; causing subvaginal œdema, with consecutive neuritis and partial atrophy.

¹ First pointed out in 1875, by Dr. J. Hughlings Jackson.

B. A new growth, very chronic in its development and course, situated in any part of the brain. The neoplasm causing pressure in all directions, with accidental passage of arachnoidal fluid through a few of the weaker foramina into the outgoing nerve-sheaths; this serous exudation producing incomplete choking of the nerve, followed by inflammation and atrophic degeneration.

Fourth. Sclerosis of the posterior columns of the spinal cord; the disease having advanced as far as the beginning of the stage of full development, without complication or extension of morbid process.

ARTICLE VI.

STERILITY DUE TO CONTRACTION OF THE UTERINE CERVICAL CANAL, COMPLICATED OR NOT BY FLEXIONS OR VERSIONS, SUCCESSFULLY TREATED MECHANICALLY BY THE UTERINE BOUGIE. By E. A. SPOONER, M.D., of Philadelphia.

UNDOUBTEDLY the most numerous cases of sterility are due either to a simple contraction of the cervical canal, or to such contraction complicated with one of the various flexions or versions of the uterus; and although treatment of the former by dilatation and of the latter by pessaries has long been in vogue, patients and gynecologists have shared their disappointments innumerable.

Convinced that pessaries in women who have not borne children frequently give rise to irritation or inflammation, thereby adding another impediment to conception, I have long since abandoned their use in the treatment of these cases, employing such supports for patients requiring relief from prolapses or other displacements without regard to the question of conception.

Fortunately, many cases of flexion or version are amenable to the treatment of the uterine bougie, and when occurring as complications of a partial atresia of the cervical canal, the correction is readily made coincident with the dilatation. I have, indeed, been surprised at the ease with which long-existing and extreme flexions have yielded to the plan of treatment which I am about to describe.

The bougies which I use are of steel, nickel-plated; they are $10\frac{1}{2}$ inches long, the extremity slightly tapering for about half an inch; the curve occupies $2\frac{1}{2}$ inches, being an arc of a circle of $3\frac{1}{4}$ inches radius, the shaft is $5\frac{1}{2}$ inches, and the handle is $2\frac{1}{2}$ inches in length, upon the anterior surface of which is stamped the size in French and English scale. The sizes which I have found requisite are 11, 13, 15, 17, 19, and 21, French scale.

My mode of treatment is as follows: If the patient presents a moderate contraction, one admitting with considerable resistance No. 11, I introduce the first three of my series in quick succession, and repeat the operation every week until the larger numbers are easily introduced; this operation, consisting of the introduction of the entire series, is repeated weekly for six weeks or two months, after which intervals of two weeks are allowed until two more months have passed, when only one operation each month, consisting of the introduction in quick succession of Nos. 13, 15, 17, and 19, is required; this final series of dilatations I am careful to subject my patient to on the day following the cessation of menstruation.

With patients presenting flexions or versions I frequently allow a medium-sized bougie to remain introduced one to two hours, giving a nurse or attendant instructions for its removal. I also enjoin upon the patient to remain in a recumbent position, with the body inclined in the direction opposed to the displacement, thereby greatly aiding the restorative action of the bougie; thus, with a right lateral version I put the patient upon her left side; with a posterior version I put the patient on her abdomen, etc. etc.

In extreme contraction it is sometimes necessary to precede the use of the bougie by an operation with hysterotome, and I have found with this instrument that three slight incisions are better than one or two deeper ones. After the cutting I leave a wax or gutta-percha bougie $3\frac{1}{2}$ inches long, introduced for $2\frac{1}{2}$ inches within the uterus, permitting this to remain for 36 to 48 hours, following its removal by the dilatations with the metallic bougies and proceeding thereafter the same as with ordinary contractions.

Mrs. D., my first successful patient, consulted me in June, 1862. She had been married nine years, had menstruation regularly, but suffered frequently from dysmenorrhœa. The No. 11 bougie was introduced with some difficulty, taking a right lateral direction. I pursued the treatment described above, using the first three numbers about four weeks, the entire series for two months, and the intermediate, say 13, 15, 17, and 19, only twice, when conception followed and she became a mother.

Mrs. K. consulted me in October, 1863. Had been married eleven and a half years. Menstruated regularly, but suffered severe dysmenorrhœa every alternate period. The bougie indicated a retroflexion. I introduced the entire series, giving considerable pain. Left No. 15 inserted for an hour after the first seven operations, keeping the patient on her abdomen during the retention of the bougie, and directing her to occupy this position as much as possible when in bed. The intermediate series were used four months on the days following the cessation of menstruation, after which she became pregnant, and is now the mother of six children.

Mrs. M. consulted me in January, 1865. Had been married thirteen years; menstruated irregularly, and suffered frequently from dysmenorrhœa. This was a case of extreme contraction. I made three slight incisions with the hysterotome, one anterior and two lateral; left wax bougie in cervical canal for 48 hours; followed its removal with daily introduction of Nos. 13, 15, 17, 19, and 21 for one week, and weekly introduction of 13, 15, 17 and 19 for three weeks, and monthly introductions after ten menstruations, when she became pregnant, and is now the mother of three children, and enjoying perfect health.

Mrs. H. consulted me in May, 1881. This patient had been married nine years; had menstruation regularly, sometimes attended with pain. I found her wearing a closed lever pessary, inserted by a well-known gynecologist, who had been treating her for sterility and retroversion for two years previous to the time she was placed under my charge. I removed the pessary and gave her a mild astringent injection to relieve the leucorrhœa caused by the pessary, and subjected her to the bougie treatment, introducing the entire series at one visit, repeating weekly for one month, and monthly for four months, when conception followed and she gave birth to a son the following August.

The above are selected from my list of twenty-seven successful cases, as typically illustrating my plan of bougie treatment. It is proper to note that in those cited no therapeutic agent was resorted to; the only directions that were given those patients were such as related to the general health.

Chlorotic patients, such as suffer scanty and painful menstruations, are greatly benefited by the exhibition of the tartrate of iron and potash during the inter-menstrual periods; but it is important to suspend this treatment immediately upon the eruption of the menses, and to renew it only after menstruation has entirely ceased. On the other hand, with women who suffer from excessive menstruation and in whom only a uterine congestion is locally recognizable, iron is of course to be carefully avoided, and the bromides, belladonna, quinine, etc., administered. But it is to the uterine bougie that entire credit belongs for the success which has attended my treatment in more than twenty cases of sterility occasioned by stricture of the cervical canal.

I cannot close this article without calling the attention of the medical profession to the fact that in my hands and in those of my friend Dr. Skillern the No. 11 bougie of my series has been proved to be peculiarly useful as a uterine sound. It would seem that the curve which I have adopted is practically the one which follows the normal longitudinal axis of the womb, and consequently it rarely happens that much difficulty is experienced in its use.

In extreme retroflexions it may sometimes be necessary to aid the progress of the bougie by pressure against the posterior wall, with a finger

introduced into the rectum; but after two or three insertions, allowing the bougie to remain in position an hour or so, and the patient observing the directions above described, there will be little trouble in proceeding with the treatment. I will add that Mr. Teufel, of 114 South 10th Street, has succeeded admirably in making my uterine bougies according to my wishes.



The accompanying cut represents my bougie, showing relation of curve to shaft, etc.

ARTICLE VII.

A CASE OF AINHUM. By LOUIS A. DUHRING, M.D., Clinical Professor of Diseases of the Skin in the University of Pennsylvania.¹ With MICROSCOPIC EXAMINATION by HENRY WILE, M.D.

THE notes of the following case of ainhum, together with the specimen, have been sent to me by Dr. George B. Simpson, of Weston, West Virginia, by whose courtesy I am enabled to present this report.

The patient is a negro, forty years of age. When about ten years old he noticed a furrow in the digito-plantar fold of the little toe, upon both feet, which gradually began to increase with considerable constant pain. The toes gradually enlarged, and, in the language of the patient, "the skin seemed to deaden on the outside, but down in the creases was very tender and painful." Dr. Simpson first saw the case ten years ago, at which date one toe seemed nearly amputated, and could have been easily cut off with a knife without loss of much blood and without pain. Time finally amputated one toe about two years ago. This specimen Dr. Simpson was unable to obtain, as the patient was superstitious and insisted upon burying the member. The other toe dropped off a few months ago, and was at once placed in alcohol and prepared for microscopic examination.

In addition to the above history, Dr. Simpson learned the following interesting facts: That the father of the patient lost both toes in the same way; one he cut off with a chisel. The mother, moreover, is at present suffering with the same disease, but has not as yet lost either toe. She desires to have them amputated, as she cannot wear shoes with comfort.

¹ Read before the American Dermatological Association at its seventh annual meeting, August 29, 1883.

These statements are of interest as pointing to heredity as a cause, to which factor in the production of the disease Dr. H. Weber has already referred.¹

I am indebted to my assistant, Dr. Henry Wile, for the following exhaustive study of the microscopic appearances of the specimen.

"Macroscopically, the specimen consists of the ungual phalanx of the right little toe. It is irregularly spheroidal, is about one inch in diameter, and on the dorsal surface is a well-developed nail. On the proximal end is the place of attachment, consisting of a round, one-quarter inch in diameter, somewhat uneven surface with a concentric appearance very much like the end of a coil of thick paper. The entire specimen is of a pale-whitish hue, extremely hard (it having been preserved in alcohol), though presenting a swollen, oedematous appearance.

Sections prepared for microscopical study were made perpendicular to the plane of the attachment; the same were stained with borax carmine, cleared up in turpentine, and mounted in Canada balsam.

Under low power (25) the horny layer of the epidermis is seen to be increased in thickness, compact, though easily separated into layers; slight separations in the form of irregularly-shaped linear empty spaces frequently being seen. Passing downward towards the rete, the epidermis assumes a marked scalloped form, which is indicated by a few layers of more deeply stained cells. This scalloped form or arrangement of the cells is occasionally continued through all the layers of the epidermis, appearing on the surface in the form of papillæ-like elevations and depressions.

The papillary layer of the epidermis is very deep, each papilla being elongated, slender, or spindle-formed, with pigmented borders. Some end in sharp points, others are more rounded, while the pigment is rather unevenly distributed, in some places being quite extensive, in others scanty or even wanting.

The papillæ of the corium are also elongated, and are much enlarged, being plainly visible to the naked eye. The enlargement is specially marked around the face where they present a swollen appearance. Their capillaries are greatly dilated, winding, and packed with corpuscular elements. The perivascular space is occupied by a deposit of small round cells, which, as we pass downward into the different layers of the corium, increase in extent, in some places being considerable, and extending in the meshes between the bundles of the surrounding connective tissue. The connective tissue and smooth muscular tissue, arranged in bundles of various thickness, cross and intervene so loosely as to leave larger and smaller empty spaces. This is more noticeable in the lower layers of the corium in the vicinity of the sweat glands; and near the small bloodvessels, especially the small veins and capillaries, the appearance is such as would indicate the presence, during life, of considerable exudation whose only residue consists of scattered, smaller and larger, collections of lymphoid cells, which occupy these spaces.

The bloodvessels are numerous, the arteries for the most part being contracted and full of corpuscles. The adventitia of the large arteries is noticeably increased in thickness, as are also the media and endothelial lining. The capillaries and small veins of the upper layers of the corium, and particularly those vessels forming plexuses about the sweat-glands, are all

¹ Trans. Path. Soc. Lond., vol. xviii. p. 277.

engorged with blood-corpuscles. The veins, especially the larger ones, are empty, while the lymphatics are greatly distended; and, the contents having been fluid containing little cellular matter, their lumen is empty. In some places the pouch-like dilatations are marked, and contain some cellular debris. Here and there in the upper layers of the corium parts of ducts of sweat-glands are met with whose walls and lining cells present an atrophic appearance. The coils of sweat-glands are numerous, and, lying between the bundles of smooth muscular tissue in the lower layers of the corium, they have a small lumen, and present the same shrunken, contracted, atrophic condition as the ducts. Between the coils of these glands there is an extensive growth of areolar connective tissue containing fat cells and a varying amount, sometimes considerable, of lymphoid cellular infiltration.

The subcutaneous connective tissue contains a scant amount of fat.

With higher power (250) the appearances above described were confirmed, and the character of the changes in the tissue elements was brought out in clearer definition. The cells composing the horny layer of the epidermis are swollen, occasionally cloudy and granular, but for the most part present a peculiar hyaline appearance. They contain a nucleus which grows smaller as we ascend to the surface. The pigment in the rete Malpighii is confined to one layer of cells—that layer of cylindrical cells which is situated next to the papillæ of the corium—the pigment being more extensive around the lower part and the sides than on the top of the papillary layer of the rete.

The capillaries of the papillæ and upper layer of the corium are greatly dilated and full of white and red corpuscles. The immediate neighbourhood of these vessels is the seat of lymphoid cell infiltration, which is more extensive in some places than others. Occasionally this cell infiltration has gone on to organization, forming connective tissue which appears as a ring around the vessels.

Between the decussating fibres of the connective tissue are also seen here and there variously sized collections of small round cells which apparently have no connection with any bloodvessel. Around and among these clusters many spindle cells are seen, which is an indication that the process of organization and formation of new tissue is going on. Further proof of this fact is found in the presence of a considerable amount of young, embryonic connective tissue in the immediate vicinity of these small round exudation cells.

In lower layers of the corium the bloodvessels, dilated and full of red blood corpuscles, are often surrounded with numerous fat vesicles, which are also found in great abundance in and about the coils of sweat-glands.

The sweat-glands lying in large spaces between bundles of smooth muscular tissue are surrounded by a plexus of capillaries and venules, which are also in a state of intense congestion. There are, besides this, large round alveoli filled with lymphoid cells, between which the parts of coils of sweat-gland may be observed.

Approaching the place of attachment the epidermis is observed to grow thinner gradually, and finally end in a point. It does not slant down smoothly in a straight line; it descends with step-like processes. The papillary body also ends abruptly, and the space beyond is occupied by closely connected bundles of connective tissue, intermingled with several strands of yellow elastic tissue. At the end or place where there was connection with the pedicle the tissue has the appearance of having been cut square by a knife.

The observations made may be briefly enumerated as follows:—

1. Increase in thickness of epidermis.
2. Enlargement and elongation of papillary body.
3. Bloodvessels of papillary body, also perivascular spaces, dilated and filled with red and white corpuscles.
4. The meshes of the connective tissue of the corium contain larger and smaller clusters of small round cells, which for the most part immediately surround the bloodvessels. In some places the cells composing these cellular collections have gone on to organization-forming tissue.
5. The lower layers of the corium are composed of loosely arranged bundles of connective tissue and smooth muscular tissue, between the bundles of which are variously sized empty spaces.
6. Bloodvessels are everywhere numerous—arteries, capillaries, venules dilated and filled with blood-corpuscles.—*Veins for most part empty.*
7. In the walls of the larger arteries there is a noticeable thickening of the media and adventitia, and proliferation of endothelium.
8. Lymphatics distended, but mostly empty.
9. Sweat-glands numerous, but atrophic.
10. About the coils of sweat-glands are numerous fat vesicles and round alveoli filled with lymphoid cells.
11. The tissue attached to the pedicle composed of connective and yellow elastic tissue closely packed together.
12. The epidermis observed to descend with step-like processes to the place of attachment.
13. Altogether the general impression which all the foregoing observations would tend to make in connection with a careful study and comparison of sections, is one that would be conveyed by the study of a tissue, the seat of a chronic *inflammatory œdema*.

As far as a judgment, based upon a microscopic examination of one specimen may go, I am led to believe, that the entire process is due to a disturbance of the circulation. Furthermore, that the cause of such disturbance was intermittent in its action. Such causes have been assigned by Dr. Da Silva Lima,¹ in the form of "limited, or localized scleroderma," and by Drs. Heitzmann and Atkinson,² in the form of a thin ligature applied "with a purpose and persistence." Believing in the intermittent action of the cause, which is clearly indicated by the condition of the tissues, particularly the bloodvessels, I regard the latter as the most probable explanation. Supposing a ligature to have been applied, the superficial veins suffering first from compression, it prevented the return of blood, while the deep arteries being free, continued to supply blood to the part and pass into a state of congestion in which there was some exudation into the surrounding tissues. The ligature being removed, the compression was relieved, and larger veins becoming free conveyed blood away from the part. That the larger veins were free, is shown by the specimen in which their lumen is for the most part empty. A reapplication of the ligature caused a repetition of the process, each time giving rise to more cell exudation, which finally brings about a condition known as *inflammatory œdema*. In this condition we find spaces between the bundles of tissue occupied by an exudation containing a considerable amount of cells, in contradistinction to the condition of simple œdema, in which the exudation contains little or no morphological products. The *inflammatory œdema* increasing, causes a compression of

¹ Archives of Dermat., Oct. 1880, p. 467.

² Trans. Amer. Derm. Assoc., 1881.

the veins, which interferes with the return current, and keeps the part in a state of congestion. This in turn keeps up the inflammatory œdema which must sooner or later end in necrobiosis. The ligature, then, is in my opinion probably the cause of the *disease*. Of the points enumerated, the twelfth is the only one which sheds any direct light or furnishes any tangible evidence in favor of such a mode of procedure. On one section 8 step-like formations were counted, on another, 7.

I wish to state, in conclusion, that only skin and subcutaneous tissue were examined,—not the bone."

Concerning the cause of the disease difference of opinion prevails. The view expressed by Dr. Wile, namely, that a ligature must be regarded as the cause, is that which has already been put forth by Drs. Heitzmann and Atkinson, in their communication to this Association, and is based solely upon microscopical study. On the other hand, such a cause is not even hinted at by such accurate clinical observers as Da Silva Lima. Now, however, that it has been suggested, it behooves clinicians to verify or disprove the assertion.

But few cases of the disease have been reported in our country. Its geographical distribution includes chiefly the West Coast of Africa, and certain countries in South America, more particularly Bahia, Rio de Janeiro, and Buenos Ayres. But cases have also been encountered in North Carolina, by Drs. Hornaday and Pitman,¹ while the case in the present report occurred as far north as West Virginia. As the disease becomes better known, it will, doubtless, be found that it is met with throughout our Southern States, though, probably, as one of the rarer diseases.

ARTICLE VIII.

OSTEOTOMY FOR BOW-LEGS. By W. H. CARMALT, M.D., Professor of Surgery in Yale College, New Haven, Connecticut.

LIZZIE DOTY, aged 5 years, was admitted to the New Haven Hospital on April 8, 1882, with extreme curvatures outwards of the tibiæ and fibulæ of both legs, somewhat more marked in the left than in the right. The child was well nourished, in face and chest almost robust; except for slight epiphyseal enlargements at the carpo-radial articulations, there was no other deformity than those associated with the bow-legs. Each femur had a well-marked *anterior* curve, but no lateral; the condyles were all on the same horizontal plane, and a straight line drawn from the centres of the patellæ to the apices of their corresponding great trochanters passed as nearly as might be along the median lines of the femoræ. On applying the internal condyles together, the legs below the knees crossed in the manner represented in Fig. 1, in which the external side

¹ North Carolina Medical Journal, Sept. 1881.

of each foot to the ankle was, when the child was held in the erect position (for she was quite unable to stand so), applied to the floor. Bringing the ankles together the knees were widely separated, and in resting the foot flat upon the floor, quite an angle was made laterally with the leg

Fig. 1.



Fig. 2.



(Fig. 2). This angle was principally due to a bend in the tibia and fibula just above the ankle-joint, but it was also evident that the main curvatures were in the upper part of the legs just below the tuberosities of the tibiae. The child could not balance herself in this position with the feet close together, but required some external support. When allowed to stand alone the position taken was with the feet straddled widely apart, so that in walking she swayed from side to side with a most ungainly waddle; she could walk but a short distance. On April 24, with the assistance of Dr. Chas. T. Poore, of New York, to whose kind advice much of the good result of this case is due, I divided by separate incisions both tibiae and both fibulae at points about one inch and one and one-half inch respectively below the level of the tubercles of the tibiae, using Macewen's chisels with a mallet in making the sections of the bones. During the operations the wounds in the skin were kept irrigated with a two and a half per cent. solution of carbolic acid. After the fractures were accomplished the legs were brought into as nearly a straight line with the femurs as possible, all coagula were carefully pressed out of the wounds, and the latter closed by borated cotton and strips of adhesive plaster; plaster of Paris splints from knees to ankles were put on, with the legs as straight as possible, and the two limbs were fastened together.

The morning after the operation the temperature was 99° , the child was restless, but did not complain of pain; on the second day fenestræ were cut in the bandages opposite to the wounds, no discharge was found on the cotton, but one external wound, that over the left tibia, was not united. On the afternoon of the fourth day after the operation the temperature arose to 99.8° , remained so the next morning, but fell to 98.2° in that afternoon, and never rose above 99° again during her stay in the hospital.

There was never any suppuration from the track of the wound; the splints were removed on May 28, just one month from the operation,

because of some excoriations of the skin at the edges of the fenestræ. The union of the bones was quite firm, the curvatures (angularities) at the upper part of the legs were quite removed, those at the lower part being, of course, still uncorrected. The lateral ligaments of the knee-joint had been so stretched, from the manner in which formerly the weight of the body had borne upon them, that the joint had quite a perceptible lateral movement; the patient was, therefore, not allowed to walk, the legs were kept straight by being tied together for several weeks longer. She was then allowed to walk with a pair of shoes with braces reaching on each side of the limb to about half way up the thigh, with fore and aft hinge-joints at knee and ankle. Locomotion, however, was still quite awkward, but she was allowed to go home to return for further treatment, which she did on November 25, and on December 17, osteotomy was again performed on all four bones at one sitting at points about three inches above the malleoli, and under the same precautions as

Fig. 3.



to sepsis as before, except that the wounds and legs were afterwards dressed in carbolized cheese cloth. The legs were firmly bound together, after being straightened with a compress of uniform thickness between them, so that they were parallel from ankles to knees.

The temperature did not rise above normal until the afternoon of the second day, when it reached 98.9° , which point it also reached the next afternoon; after that it fell and never rose above 98.4° again. On the third day after the operation the carbolized dressings were removed as a slight carbolic eczema had been excited and borated cotton was substituted. On December 24, the external wounds having quite healed, the legs were put up in plaster of Paris splints. On January 27 these were removed, and the legs bandaged together with a straight, short splint between them reaching to the knees. On February 17 the splints were removed and the shoes with braces put on; she walked fairly well, but from long habit separated the feet widely, and did not bend her

knees much. She improved in this respect, however, and at this date, August 13, 1883, one would hardly remark that there had been any deformity. The photograph of Fig. 3 was taken on February 24, the date of her removal from the hospital.

ARTICLE IX.

ON THE TREATMENT OF HAY-FEVER AND ALLIED DISORDERS. By HARRISON ALLEN, M.D., Prof. of Physiology in the Univ. of Pennsylvania.

IN the number of this JOURNAL for January, 1880, page 61, the writer contributed an article on the treatment of chronic nasal catarrh, and drew

the following conclusions as the result of the study of an important group of cases :—

“Obstruction is fatal to the efficiency of the nasal chamber as a respiratory and olfactory apparatus. . . . When a point of contact exists between surfaces which normally should not touch, the indication for the treatment is to destroy it. . . . This is accomplished by local remedies applied to the mucous membrane at and about the place of contact; or, in examples of abnormal deflection of the nasal septum, by removal of the offending portions of bone. In the case of the inferior turbinated bone, the swollen and engorged tissues accompanying the inferior meatus may be removed by the knife. . . . Improvement is apt to occur at times when occlusions disappear. In a word, the restoration of the nasal chamber to its proper use, *i. e.*, as a respiratory chamber, is often alone sufficient to cure the disease. . . . As a rule, it may be said that obstruction is followed by loss of function and distress; and when such obstruction exists, it should be removed when practicable.”

The writer believes these conclusions were original with himself, and when first presented in a verbal communication before the Philadelphia County Medical Society, on the evening of Sept. 24, 1879, were allowed to go unchallenged as to any claim to originality, while they were vigorously assailed on their own merits. After an additional experience of four years, the writer is able to endorse the conclusions formed at that time, and to apply them to a yet larger group of cases. Reference is made especially to the cases of nasal disorders ordinarily grouped under the term “Hay-Fever.” An effort will be made to prove that, putting aside the question of the etiology of this curious affection, in practice it may be met on the same plane as any other nasal affection, and that the means of effecting its cure are simply to overcome the tendency to obstruction of the nasal chambers.

The symptoms of hay fever are always associated with some degree of obstruction of one or both nasal chambers. A cause of this obstruction is dilatation of the bloodvessels. There is no doubt that the local phenomena are in most instances the same, and that the multifiform related symptoms, such as injection of the eye, headache, malaise, asthma, etc., are due to reflex vasomotor disturbances. But many patients report for treatment who exhibit swelling of the nasal mucous membrane, occlusion of the respiratory passages, and mucoid or semi-purulent discharge, without any of the related reflex phenomena. Yet a third and intermediate group exhibit perhaps a tendency to turgescence of the mucous membrane, together with one or more of the more common constitutional symptoms of typical hay-fever. Indeed there is nothing peculiar to the disease just named save its sharply defined periodicity, particularly in that phase of it where the periods of recurrence happen to coincide with the time of fruitage of certain plants, or the gathering of certain crops. In a small group of cases where, in addition, other signs and symptoms become prominent which would invalidate the above proposition, I am inclined to attribute them to mental impression—in some of the varied phases of hysterical or neurotic excitement.

Or the case may be stated in different language, as follows : In an imperfectly defined group of cases of nasal catarrh, a sensation of sudden obstruction of one or both nasal chambers is a conspicuous symptom. This sensation is accompanied by a constant change in the chambers themselves, viz., engorgement of the membranes over the turbinated bones, producing pressure against the septum and occlusion of the respiratory passages of the nose. The sensations are recurrent, but vary greatly as to the time of the day or the season of their return. With some patients they are nocturnal, and are associated with the recumbent position ; with others they occur after meals only ; with some they occur in the summer season ; with others yet again in the winter. The sensations may be confined to either chamber, or be present in both. In aggravated cases they are associated with numerous reflex symptoms, among which may be mentioned lachrymation and hyperæsthesia of the conjunctiva, headache, and asthma. Patients having a disposition to obstruction during the summer and autumn report themselves as suffering from "hay-fever;" while those having alternating attacks in the right and the left chamber report with "nasal catarrh."

The cases exhibit one feature in common, viz., that the inferior turbinated bones lie well above the plane of the floor of the nasal vestibule.¹ It will thus be seen that the mucous membrane, which is known to be the most erectile, is also the most exposed to irritation from extraneous substances, and to changes in the temperature of the surrounding air. In many persons not the subject of "hay-fever" and allied disorders, the lower free portion, including, of course, the inferior border of the bone, lies below the plane of the floor of the nasal vestibule; and in ordinary inspection the inferior meatus is out of sight.²

The following cases will now be detailed in illustration of periodic obstruction of the nasal chambers. Of these, Cases IV., V., and VI. are alone to be considered as cases of hay-fever; and of these, Cases V. and VI. were typical ones. Yet it will be found that all the patients were relieved by essentially the same plan of treatment.

CASE I. A lady aged 40, of spare habit, light complexion, nervous disposition, and with hair inclining to red,³ reported for treatment March 7,

¹ A number of cases are explained in the communication above quoted, page 69, as caused by the too free ingress of irritating currents of air, and the resultant continual exposure of the membranes to the contact of extraneous substances, and to abrupt changes in temperature.

² It is an interesting fact that no form of nasal chamber other than the one retaining the "raised" inferior turbinate is figured by E. Zuckerkandl (*Normal und Patholog. Anatomie der Nasenhöhle*, etc., Vienna, 1882). The writer has notes of many examples of the "depressed" inferior turbinate; indeed, in the adult, it appears in this country at least to be a very common variety.

³ The descriptions of colour of hair, kinds of complexion, etc. have been inserted in place of the names of the temperaments, as defined by the older writers. Certainly in the United States, however different may be the case in England, the Iberian and

1882. Two years before she had suffered from a severe attack of acute coryza. From the time of the subsidence of this attack, the nasal mucous membrane was exceedingly irritable, and with this condition was associated a mucoid discharge from the nostrils. The chief symptom, however, for which she reported, and which existed entirely separate from the causes which excited the original coryza, was loss of rest, due to obstruction of both nasal chambers coming on after the patient had retired for the night. At times this obstruction would be announced immediately after retiring, but more frequently it would come on during sleep. The patient would then be awakened by the distress arising from mouth breathing, and be from that time unable to sleep. Owing to this disposition, a tendency to laryngeal catarrh and to loss of smell was noticeable.

An examination of the nasal chambers showed that the left chamber was the smaller, though no septal deviation was detected. The anterior half of the left inferior turbinated bone was somewhat erectile. When a cotton-tipped probe was pressed against the membrane, and then quickly withdrawn, the depression caused by the instrument was instantly obliterated. The same condition existed on the right side, but to a less degree. The muscles of the palate, especially the palato-pharyngei, were relaxed, the tonsils were small and concealed, and the vocal cords congested. The naso-pharynx and posterior nares were normal.

The patient remained under treatment until May 1, 1882, and repeated opportunity was afforded for inspecting the condition of the nasal chambers and throat. Not in a single instance was the obstruction complained of ever detected. Here was evidently a recurrent or periodic congestion, due to causes which may be considered as sequelæ of ordinary winter catarrh. The case was first treated by the exhibition of strychnia and iron, and the application of a constant electric current to the pharyngeal and nasal structures. The patient was directed to keep an electric battery in her chamber, and at the time of the commencement of the obstruction to transmit a current of ten cells directly through the cheeks. This was followed by the happiest results, but did not effect a cure. Destruction of the angiose tissue at the anterior ends of the inferior turbinated bones by the galvano-cautery was finally determined upon. After the eschars had separated, and the irritation attending the use of the agent had subsided, the tendency to obstruction arrested and the patient ceased reporting, all her symptoms having disappeared.

CASE II. A young man, aged 20, with light hair, fair complexion, and a tendency to comedo, with large pupils, pearly teeth, marked with an occasional milky opacity; and the nails of the hands showing white maculæ; reported with the symptoms of nasal catarrh, which had persisted from childhood. The discharge was mucoid and moderate in quantity. The patient enjoyed entire exemption from all the symptoms during the summer months. The times of greatest distress were while lying in bed at night, and while exposed to the wind on bleak, cold days. At such times nasal respiration was rendered impossible, distressing frontal headache and lachrymation were established, while an occasional asthmatic attack would supervene. In other respects the patient enjoyed good health.

Examination of the nasal chambers showed that the left was somewhat

Celtic types have so inextricably commingled, that one cannot retain the term temperament and its various subdivisions of "bilious," "sanguine," etc., with the confusing sub-subdivisions of "bilio-nervous," "sanguino-nervous," etc., with any advantage.

the smaller, and on this side the septum was deviated to a moderate degree. The anterior ends of both inferior turbinated bones were engorged and red, and were covered with a glistening, mucoid discharge. The right middle turbinated bone was large and engorged, pressing against the septum. The pharynx and palate were normal, while the posterior nares were occluded by yellowish-white masses, which were identified with the posterior ends of the inferior turbinated bones, but which appeared to be absolutely without bloodvessels.

The treatment consisted in the free application of the galvano-cautery to the turbinated bones, both in front and behind. The patient was susceptible to pain to an unusual degree, and demanded the use of an anæsthetic for the destruction of the posterior hypertrophies. The use of the cautery was decided upon after failure to include them in the loop of Jarvis's snare. The day following the treatment the patient reported with a sharp attack of earache, which was found associated with a large, dry plug of cerumen in the external meatus. After the plug was removed the symptoms subsided. After this treatment of the nasal mucous surfaces had continued for a period of six weeks the symptoms disappeared and did not return.

CASE III. A young lady, aged 18, a resident of a mountainous rural district, reported January 9, 1882, having complained for eight years of a distressing recurrent obstruction in the right nasal chamber. She had been subject to attacks of tonsillitis in childhood, was anæmic, and suffered from a disposition to nausea immediately after waking in the morning. The patient had been exceedingly nervous from infancy, had always been a poor sleeper, and had never been able to breathe through the left side of the nose. As a consequence of this disposition, when the right side was obstructed during an attack, mouth-breathing was necessitated. At the time of obstruction the patient complained of headache, lachrymation, and attacks of sneezing.

On examination the left nasal chamber was found obstructed anteriorly by an osseous spur, which extended the entire length of that portion of the vomer which is exposed at the ethmoidal notch. The chamber was, in addition, everywhere narrowed,¹ and the inferior turbinated bone freely exposed from in front. The right chamber was capacious, and at no point revealed existence of any abnormal condition. The naso-pharynx was exceedingly irritable, and its examination by ordinary means impracticable. By the aid of the finger passed above the palate, it was ascertained that a firm, rounded mass projected slightly beyond the plane of the left posterior naris, while the parts in the neighbourhood of the right posterior naris remained unimpaired. The tonsils were enlarged, but in other respects the pharynx was normal.

Treatment began at the date of the patient's first report, January 9, 1882, and continued until March 8, 1882. Without detailing the separate steps of this treatment, suffice it to say that it consisted in restoring the left nasal chamber to its use as a respiratory passage, and in destroying the disposition to turgescence on the part of the membranes in the right nasal chamber. To accomplish the first, the long osseous spur was filed off and the ethmoidal cartilage was separated from the lower

¹ The left nasal chamber in this case, and the left nasal chamber in Case VI., are instances of congenital narrowing of the nasal chamber, as defined by the author, without deviation of the septum. See *Trans. Amer. Laryngol. Assoc.*, 1883.

border of the ethmoidal notch, and pushed over to the right side. Applications were made by the galvano-cautery to the posterior end of the right inferior turbinated bone, and the same agent was used in reducing the size of the tonsils. This line of treatment, which was a severe test of the patience and courage of the young lady, was in the end successful. A recent report received from her parents, dated November 22, 1883, stated that the cure had remained permanent.

It is particularly interesting in this case to observe that as a result of the treatment not only did the disposition to headache, lachrymation, and sneezing disappear, but without the aid of any internal treatment whatever, all signs of the long standing anæmia and malaise disappeared. The nervous disposition so noticeably developed was, as a matter of course, not influenced by this local trouble, and the curious phase of vomiting persists. In this case it would have been easy to assume that all the symptoms were neurotic. The persistence of distress on the right side of the nose, and the well-defined periodicity of the attacks, were facts well established.

CASE IV. A merchant, aged 30, nervous disposition, brown hair, with light complexion, and a tendency to dark rings under the eyes, came under treatment April 11, 1881, having suffered for five years from attacks of obstruction of the nasal chambers, associated with tickling sensations, sneezing, headache, smarting of the eyes, etc. These attacks were entirely independent of weather, locality, and season; they were accompanied by the discharge of a thin mucoid secretion; would last from four to six days, and would then subside as suddenly as they appeared, but left the system depressed, and caused the patient to have the appearance of a man recovering from a debauch.

Examination showed the anterior extremities of both inferior turbinated bones swollen, œdematous, and macerated. The bones were in addition exposed throughout their entire length, that is to say, the inferior margins were clearly seen by the aid of direct light, and were everywhere above the plane of the floor of the vestibule. The membranes were pendulous. The chambers were symmetrical. The membranes were everywhere of an intensely red colour, and presented a striking contrast to the pallor of the dermal lining of the nasal vomer. The examination of the posterior nares revealed a symmetrical vomerine swelling. The pharynx was normal.

The treatment, which extended over a period of one month, consisted in using the galvano-cautery freely over the anterior extremities of both inferior turbinated bones. These applications were accompanied by more than the usual amount of distress, the patient being exceedingly sensitive to pain. When the patient had recovered from the effects of the treatment and the eschars had separated, the symptoms disappeared and did not return.

CASE V. A farmer, aged 21, having light-brown hair, hazel eyes, and fair complexion, came under treatment January 26, 1883. When six years of age he had suffered from an attack of membranous croup, and from this time on, had suffered periodically with summer asthma. The attacks would begin about the first of July and last well into the autumn. They were accompanied by a constant disposition to lachrymation, by nasal obstruction, and by tingling at the roof of the mouth. During the last four years, he had had in addition winter catarrh, presenting the ordinary symptoms of muco-purulent discharge, frontal headache, etc.

On examination, it was found that both inferior turbinated bones were well raised above the plane of the floor of the vestibule, and were intensely engorged both in front and behind. The nasal chamber was somewhat the smaller, the septum being moderately deflected to the left. Both the middle turbinated bones were engorged, and behind they were seen lying against the septum.

The treatment of this case presented some exceptional features. The patient being of an excessively nervous disposition would not permit the use of the galvano-cautery. Treatment was therefore entirely confined to repeated applications of glacial acetic acid, and of nitric acid to the nasal mucous membrane. This plan was pursued till April 15, 1883, when by reason of illness in his family he was compelled to return home and has not since been seen. A letter received in September, however, stated that he had for the first time in many years escaped his usual summer asthma.

In this case, the applications of the acids evidently accomplished the same results as would have been attained by the use of the galvano-cautery, namely, a reduction in the size of the membranes covering the turbinated bones, and possibly the destruction of hyperæsthetic surfaces.

CASE VI. A gentleman aged 23, of small frame, with black hair and eyes, of somewhat nervous disposition but of excellent constitution, reported for treatment October 17, 1882. He had suffered for sixteen years from hay-fever, two other members of his family, a cousin and a maternal aunt, being similarly affected. The patient had also suffered from a chronic nasal catarrh, the principal distress from which arose from occlusion of the nasal passages. His periodic attack would begin mildly on the 10th of August, becoming more severe on the 20th or 21st, and ending about October 10th, provided he remained in Philadelphia. While it continued, deep-seated itching would be felt in the mouth, throat, and respiratory tract, generally, sometimes followed by cough and considerable expectoration. Severe and constant conjunctivitis, with itching and puffing of the eyelids, was one of the most annoying symptoms. Exposure to light increased the distress in the eyes. The attack was always worse during moist, hot days, and in a furnace-heated room, than in the open air. Exposure to any heated dry atmosphere produced occlusion of the nasal passages, with an accompanying sense of suffocation. When so induced, this occlusion was immediately relieved on the patient's going into a cold room or into the open air. He was most comfortable in cool damp weather. A sense of fulness would sometimes be experienced in the lower part of the forehead during the attack, but most of the sensations were confined to the eyes and nose. There was no pain behind the ears, and no sensation as of a band drawn about the head. At no time of the year did wheezing, shortness of breath, or genuine spasmodic asthma appear. Mental influence seemed to be nil. Tobacco had no effect; hot coffee, used only occasionally, apparently modified the symptoms for the better. In the spring the symptoms, if present at all, were very slight, and lasted for a few days only, varying from the end of May to the end of June. The occurrence of the spring attack, however, has not modified the autumnal period either as to duration or severity. At any time of the year, an acute attack of coryza might be brought on by exposure to dust, or to irritating vapours, even by smelling carbolic acid crystals; though hay, flowers, etc. would have no particular effect. The patient seemed to be singularly free from liability to "take cold" from exposure to draughts,

wetting, etc. During an attack prompt relief was obtained by a sea voyage.

Upon examination it was found that the left nasal chamber was very small in all its proportions, and firmly occluded in the maxillary and palatal portions. The septum was not deviated. The inferior turbinated bone was raised above the plane of the floor of the vestibule. Posteriorly, at the plane of the posterior nares, a well-defined swelling was detected at the upper part of the vomer. The left posterior naris was smaller than the right. The right side was capacious throughout, though the posterior naris was nearly occluded by a hypertrophy. The pharynx was irritable and injected, and the salpingo-palatal folds unusually conspicuous.

Treatment began October 17, 1882, and was discontinued on the 2d of June, 1883, with the understanding that it was to be resumed at the beginning of the usual annual attack. This attack, however, was considerably modified in severity, and throughout the whole period the patient acknowledged considerable difficulty in reporting with the typical symptoms present. While he was satisfied that something still remained to be done for his relief, the parts were always found free from congestion, and both nasal chambers were usually open, which results could be directly attributed to the treatment of the previous winter. However, on the morning of August 22, two days after the time of the usual appearance of his attack, and after a dusty railroad ride of sixty miles, he reported with a moderate amount of turgescence of the mucous membranes, which partially occluded the left nasal chamber at the beginning of its palatal third. Accompanying this condition there existed also, to some extent, the characteristic itching of the eyes, the disposition to sneeze, the tingling in the nose, etc. The galvano-cautery was at once freely applied on the left side to the opposed surfaces of the inferior turbinated bone and to the septum at the beginning of the palatal third of the chamber. The patient almost immediately acknowledged relief from his disagreeable sensations; and on several other occasions, when he had felt the symptoms returning and had appeared for treatment, he reported decided temporary benefit from the use of the galvano-cautery. On the whole, as the result of the continued repetition of the cautery applications, the distress peculiar to "hay-cold" gradually lessened, and by September 25 he considered himself well, or, to use his own language, "comfortable after incomparably less suffering than in previous years. The cauterization during the attack was accompanied with no sense of discomfort, and I invariably left your office better than when I entered it."

REMARKS.—The conclusions to be drawn from the study of the foregoing cases can be summarized briefly as follows:—

(I) That the treatment of all conditions of obstruction in the nasal chambers, no matter from what cause arising, can be successfully carried out by destroying the causes of obstruction. If the cause be an overgrowth of bone-tissue, it must be filed, sawed, or drilled away (Case III.). If it be caused by a deviated cartilaginous portion of the septum, such portion must be re-set in a new place (Case IV.).¹ If, as is often the case, it is due to periodic turgescence of the mucous membrane or the resulting

¹ See author's paper in *The Medical News*, 1882, xli. 32.

secondary hypertrophies, such growths must be destroyed, either by the galvano-cautery, by the snare, or by caustic acids.

(II) That the treatment of hay-fever and allied periodically recurring nasal affections in no way differs from the treatment of other nasal diseases accompanied by obstruction, and that the treatment may be conducted during an attack as well as in the intervals between any two attacks.¹

ARTICLE X.

ELEPHANTIASIS ARABUM CURED BY LIGATURE OF THE FEMORAL ARTERY.

By G. C. E. WEBER, M.D., of Cleveland, O. (Reported by J. G. Gehring.)

IN view of the fact that the successful operations, both in this country and in Europe, for the cure of this most obstinate disease of the lower extremity, by ligation, are so few as to be easily counted upon one's finger ends, and because of the apparent propriety of resorting to this last method before amputation becomes an imperious necessity to save the life of the patient, I take the liberty of calling the attention of the profession to the following successful case operated upon by Dr. G. C. E. Weber, of Cleveland, O.

Elephantiasis Arabum, although very rare in this country, and seldom if ever occurring among native Americans, is occasionally met with in individuals of foreign birth, such a one being the case in question. Originally occurring in certain parts of the Orient, it has gradually found its way to western Europe, and is now not uncommon in the countries bordering the Atlantic seaboard. It is a disease that is oftenest found affecting people in the lower walks of life, who, by reason of poverty and privations, and perhaps as a result of debauchery and reckless living, are ill-fed and poorly nourished and their vitality reduced to a point so

¹ The study of the above subject-matter has extended over several years, and it will be seen that Case IV. is dated April, 1881. Desiring to mature my plan and not appear hasty in drawing my conclusions, I awaited extended experience before publishing my results. I desire in this connection to state that my friends Dr. Wm. H. Daly,² of Pittsburgh, and Dr. J. O. Roe,³ of Rochester, New York, have published the favorable results of the treatment of hay-fever by surgical methods. Drs. Daly, Roe, and myself have been working in this matter independently of each other, and it is probable that other practitioners who have not yet published their results have also been laboring in the same field. It must in justice to Dr. Roe be said that in one respect he would not agree with my conclusions since he does not approve of the conduction of the treatment during an attack. In my own experience, the treatment not only may be undertaken at any time, but it is even preferable that it should be initiated during an attack, for the places of contact can be then easily determined.

² Archives of Laryngology, 1882, iii. 157.

³ New York Med. Journ., 1883, xxxvii, 512.

low as to render themselves peculiarly liable to disease and their system a ready victim to the inroads of elephantiasis.

Ligation, with a few notable exceptions, has been rarely resorted to, due in part to an improper understanding of the nature of the affection, and in consequence of this its treatment, and possibly also to a reluctance on the part of the physician to endanger the life of his patient by mortification and death of the limb.

Dr. Carnochan of New York has become the pioneer in this direction, and conceived the idea that by mechanically shutting off the supply of blood to the affected limb, the intensely morbid proliferation of tissue might be checked. Acting upon this inference, his wonderful success with his case of January, 1851, and published in a memoir in 1858, proved a powerful argument in favour of the theory advanced, and served to cause other surgeons to follow and emulate his brilliant example. He was followed by Richard G. Butcher, of Dublin, in 1861, whose classical case of a woman 44 years of age, reported in his work upon "Operative and Conservative Surgery," serves as a beautiful exposition of the complete and marvellous cure brought about by this simple method!

Butcher was followed by Bryant of Guy's Hospital in 1865, who also met with striking success in his first case of a Welsh girl *æt.* 25; several subsequent operations, however, were not equally successful. Alcott, in 1866, also operated successfully. Aside from the above cases, however, few, if any instances are cited wherein this method of surgical interference was crowned with the hoped-for results.

It may perhaps be proper in this connection to state briefly the views of different authors upon the origin and nature of this disease. Wise of Calcutta, and others, look upon it as being essentially an inflammatory disease of the venous system; an obstruction of the veins of the affected part of some nature, would check circulation, and in this manner cause irritation and inflammation, followed by plastic exudation and subsequent organization of the same in the surrounding cellular tissues. Others, and perhaps a majority of the writers upon the subject, among whom may be mentioned Gross, Bardeleben, Koch, etc., are of the opinion that the disease results in consequence of a disturbance of the functions of the lymphatic vessels; the intimate connection between the lymphatics and the connective tissues would easily tend to make the latter a ready participant in any pathological conditions in which the former were involved. Any lesion of the lymphatics—and it is usually after ulcers or other interruptions of the continuity of the integument and underlying tissues has taken place, and that nearly always below rather than above the broken part, that the swelling and infiltration of the tissue begins—would tend to be the direct initial cause. With such an obstruction of the lymphatics there would ensue an inflammatory condition followed by a retention as well as an exudation of plastic organizable matter, causing obstruction and perhaps

complete obliteration of the calibre of the vessels. An organization of the plastic matter thus retained and checked in its normal flow would be the direct sequence, and this would resemble in its structure the cutaneous and cellular tissues of the surrounding parts. But as to whether such inflammation of the lymphatics is the direct or only a secondary cause of the disease, seems yet to be open to discussion.

The case in question was as follows :—

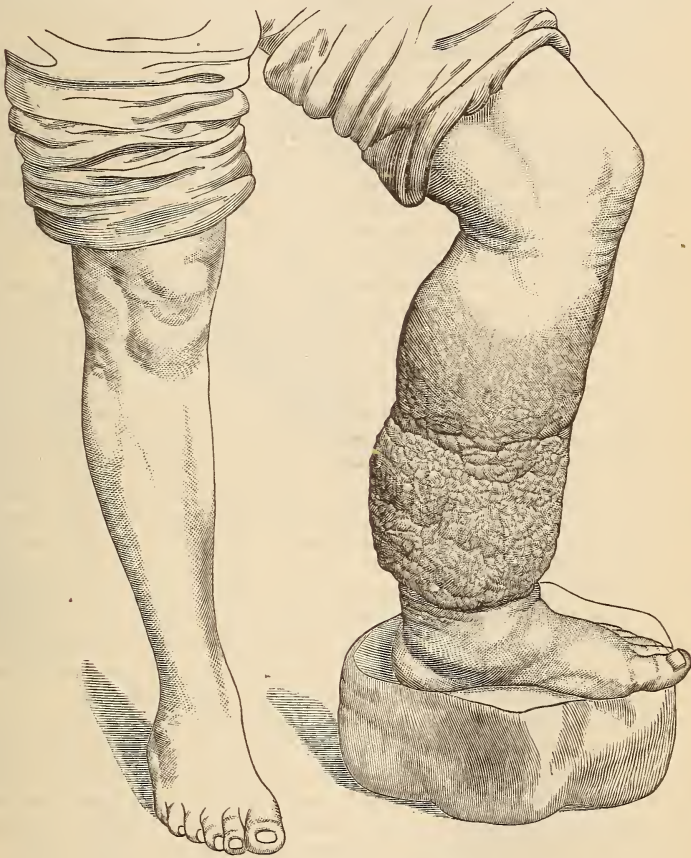
John D., a German 40 years of age, and a resident of this country for more than 25 years, came under the notice of Dr. Weber at the Cleveland City Hospital in the latter part of the winter of 1882–83. He came there for the purpose of having his left leg amputated at the advice of physicians, in consequence of an extensive hypertrophy of the integument and underlying tissues of his leg and ankle—a marked and typical case of elephantiasis Arabum, or “*Jambe de Barbadoes*” of the French. His family history as far as could be learned seems to have been good, his parents having both been healthy, save that the mother at one time had a varicose ulcer upon the leg. There were living two brothers and one sister of the patient, all in good health. The patient was a married man, and the father of three healthy children. His own health had been, until several years ago, quite good. At the time of his admission to the hospital, he had a small umbilical hernia that was causing him no inconvenience however, and was securely held in place by a pad.

The occupation of the patient was that of barkeeper, an employment that may have been no inconsiderable factor in bringing him into the condition of physical deterioration he then found himself. The clinical history of the case is as follows: about two years ago the patient met with an accident in which he fell from a wagon in such a manner as to bruise both legs; the left being denuded of a small portion of skin near the inner surface of the ankle. Shortly after this initial disturbance both legs began to enlarge from the ankle to the knee, attended by some discoloration and considerable pain. At the same time a profuse watery discharge began to exude from the denuded surface, which continued for some length of time. Then, without any apparent cause, the right leg began slowly to decrease in size, until it had again regained its normal proportions, save that the skin retained its darkened colour in consequence of pigmentary deposit. The left leg, the one with the abraded surface, near the ankle, now began to rapidly increase in bulk, the skin becoming greatly hypertrophied, rough, and swarthy with pigment. With this rapid increase in size the limb became cumbersome and unwieldy, causing the patient much embarrassment and inconvenience in following his occupation and being about. If on his feet for any length of time the circumference of the leg would increase three to four inches, this swelling again subsiding when in a horizontal position. The patient did not seem to complain of any very acute pain during this time, there being only a constant dull aching in the part, accelerated somewhat by prolonged exertion, and again relieved by quiet and rest. This condition of things was not a stationary one, however; slowly, but surely, the limb increased in size. Little by little the accumulation of organizable matter increased, one layer was added to another, the papillæ became raised and enlarged, the epidermis became proliferated so rapidly that its surface became rough and broken, until the condition of the patient became so alarming that amputation had been

advised by his friends and physicians, and he came to the hospital for that purpose.

At the time of his arrival, March 8, 1883, the leg measured 22 inches in circumference around the ankle, and 21 around the calf, with a general enlargement of the knee and thigh, diminishing toward the groin. The lower portion, as may be seen by examination of Fig. 1, from the ankle

Fig. 1.



to the middle of the calf, consisted of a decided papillomatous hypertrophy. The cauliflower-like corrugations were very marked, the papillæ being gigantic in size, rough and horny to the touch, dark with pigment, and divided by numerous fissures of varying depths from which a thin bloody fluid constantly oozed. By reference to the figure two large fissures may be seen which were about an inch in depth, one of which extended entirely around the leg just above the ankle, and the other partly around near the middle of the calf. These two great sinuses seemed to limit, above and below, the extensive papillomatous growth, making a very decided line of demarcation between the two surfaces. Immediately above the upper

fissure, the skin, although still greatly infiltrated with plastic organized material, was comparatively smoother.

At the inner side of the ankle, and just above the lower fissure, there was an ulcerous depression that was also continually discharging. The odour of the diseased limb was very characteristic, resembling that of the original secretions greatly intensified, and together with the appearance of the pachydermatous skin made the whole a most repellent object. Owing to prolonged dissipation the patient was, at this time, in a condition that precluded all possibilities of an immediate operation. His muscles were soft and flabby, the heart's action weak, and respiration laboured.

The pulsations of the femoral could be distinguished but with great difficulty, having a feeling as though situated at a profound depth beneath the surface.

The first steps to be taken were, of course, to bring the patient into a condition of better general health, in order to render the conditions for a successful operation more favourable. With this end in view he was at once put upon a preparatory course of treatment, consisting of the administration of iron and quinia, together with good doses of the tincture of digitalis repeated every six hours.

On March 16th he was considered in a fair condition for operation, although his heart's action was still quite feeble. Owing to this fact ether was administered with great care and very slowly, and it was nearly thirty minutes before anæsthesia supervened. This accomplished, an incision was made parallel to the course of the femoral, commencing three inches below Poupart's ligament, and continuing four inches downwards. With much difficulty the femoral was found, owing to its depth in the softened infiltrated tissues, and securely ligated at the point where the sheath of the vessels is crossed by the Sartorius muscle, at the apex of Scarpa's triangle. The edges of the wound were then carefully brought together by two silver-wire sutures, and additionally strengthened by transverse strips of adhesive plaster.

This accomplished, the limb was loosely encased from the toes to the groin by an ordinary flannel roller bandage, in order to give additional support to the tissues. The patient was then placed in bed, the limb slightly elevated to still further assist the flow of the returning fluids, a woolen blanket wrapped around and hot water bottles applied.

It was now necessary to keep the patient as quiet and comfortable as possible, which result one-quarter grain doses of morphia, administered hypodermically, brought satisfactorily about. From this time on the patient began to progress slowly but surely toward recovery; the tonic treatment of iron and quinia was kept up with marked benefit. His temperature, which in the beginning (after the operation), went as high as 102° F., gradually subsided, and his pulse, which vacillated between 80 and 104 in the first few days, regained its normal beat. His general condition began to improve visibly, and from a state of debility and general impoverishment, brought about by reckless living and aggravated by the intense morbid changes taking place in the diseased limb, he gained a new lease of life, and a tone and vigor, which, although far from that of robust health, he had, nevertheless, long been a stranger to. During this convalescence his leg rapidly decreased in size, and this was still farther visibly augmented by repeated applications of a solution of carbonate of soda (about 1 3/4 to 1 pint of water), used to soften the dry thickened epithelium which was then readily scraped off with a spatula. This came off in large

sheets and layers, sometimes a line in thickness, and of a sickening, sweetish, penetrating odour, not to be described. The deep fissures above alluded to ceased to discharge, and with the subsidence of the immensely hypertrophied integument and tissues between them, gradually became effaced. The wound at the ligature healed rapidly, with the exception that about one week after the operation an abscess was detected at a point a little below the position of the ligature, which upon being opened revealed a slough several inches in length, from which considerable pus was removed. After this no further difficulty was experienced, and the

Fig. 2.



process of healing went along very kindly. Between three and four weeks after the operation, the ligature permitted itself to be easily detached, and four days after this, or about thirty days after the operation, the patient was discharged from the hospital. The leg now measured eleven inches in circumference around the ankle, and thirteen inches around the calf, a difference of eleven and eight inches respectively between the present and former measurements. Fig. 2 represents the appearance of the limb at this time, although it will be observed that the proper proportions of the leg had not been fully restored, due, however, to the restrictions imposed by the bandage which had been kept constantly applied.

Upon his dismissal the patient departed for his home, and was lost sight of for some time. At the end of about six months a letter received from him reported his condition as being very satisfactory indeed, he being enabled to go about his occupation suffering no inconvenience whatever from his limb, save that upon unusual exertion a slight œdematous swelling would supervene.

In a subsequent letter he reiterates his favourable reports, speaking most thankfully of his improved condition and of the restoration of a limb, that himself, his friends, and physicians had for several years already despaired of.

For notes kindly furnished concerning the treatment of the patient while at the hospital, I am indebted to the courtesy of Dr. C. P. Linhart, of that institution.

ARTICLE XI.

PAGET'S DISEASE OR MALIGNANT PAPILLARY DERMATITIS (Thin).¹

By S. SHERWELL, M.D., of Brooklyn, New York.

THE number of cases so far reported, of this rare and interesting skin lesion, which was first brought to professional notice by Sir James Paget in 1874, is limited, and I have been able to find recorded only 27 cases, including the two herewith given. Of these cases Sir James Paget records 15,² Mr. Butlin 4,³ Mr. Henry Morris 2,⁴ Dr. George Thin 2,⁵ Dr. Duhring 2,⁶ and the author 2.

Paget, to my mind, gives the best description of the characteristics of this affection with which I have met, but he does not mention one peculiarity upon which Thin lays much stress, viz.: the papillary, soft warty epithelial projections, first occurring in and around the areola, and afterwards on the parts nearer the periphery.

¹ Abstract of paper read at meeting of American Dermatological Association, 1883.

² St. Bartholomew's Hospital Reports, 1874, vol. x, p. 87.

³ Medico-Chirurgical Transactions, 1876-77, vol. lix. and lx.

⁴ Ibid., December, 1879.

⁵ British Medical Journal for May, 1881.

⁶ American Journal of the Medical Sciences, July, 1883.

I will narrate the histories of the following cases which came under my own observation as concisely as possible.

CASE I.—Mrs. S., æt. 75, mother of several children, and in affluent circumstances, general health remarkably good, and family history unusual as to longevity and freedom from disease. About ten years ago she first noticed a weeping on and around nipple, due, as she imagined, to traumatism from the attempt at nursing a young child, her grandson. For a time the ordinary household remedies were resorted to without effect, and for some years thereafter she was treated by a number of physicians, regular and irregular, without result except perhaps an aggravation of the trouble; the diseased area, when left alone, as it had been for about three years before I saw her, slowly extending. The history and appearance of lesion was that of an ordinary chronic eczema, the discharges absolutely like that of the disease in question, and when I was called in on March 22, 1881, I unhesitatingly pronounced it to be such, and held out fair hopes of a good recovery. At that time there was no induration around the edges, and nothing but a soggy infiltration of the skin; in fact it presented no symptoms which in my mind served to distinguish it from an eczema, in a site that was exposed to attrition and irritation by clothing. The sunken or “melted away” appearance of the nipple was the only remarkable feature; there did not seem to be any true erosion or history of such at this part, and as certainly no true retraction. The axillary glands were either unaffected or else to a very slight degree at this time, but became markedly so, at a later stage; nothing deserving the name of pain in the breast was complained of, but occasionally a “burning,” and sometimes extreme pruritus over the affected surface was noticed—the subjective symptoms, in short, of a severe chronic eczema. The lesion was extensive when I first saw it, occupying the major portion of the skin over the right breast, about five to six inches, certainly involving all the mamma on that side. In and around the areola were some of those heaped-up sodden epithelial projections which have caused Thin to give it the name he does.

Believing I had an eczema to deal with, I treated it as such, using soothing and gently alterative efforts as a general indication; and for a time, as it seemed, with some effect; for a degree of attempt at repair was manifest, and the subjective symptoms were certainly lessened. This went on for some months, till at the end of June, 1881, I left for Europe, leaving her in the care of my clinical assistant. While attending the meeting of the Skin Section of the International Medical Congress of 1881, I saw some cases of this disease which were presented, I think by Dr. Morris, and I recognized this one as belonging to that type. When I returned I found it had not improved under treatment, and from that time held out to the family a very poor prognosis. On re-examination I found all the objective symptoms worse, the warty growths had commenced in other more distant parts, the axillary glands could now be felt distinctly, the burning sensations had become rather, as she said, smarting, the itching, and catarrhal discharge of the surface worse; still none of the lancinating pains so common in ordinary malignant affections of the breast were present. Palliative and anodyne applications were the only remedies used from this time, and they with only moderate benefit. The best covering for the breast seemed to be a thickness or two of waxed white paper. The symptoms grew worse from this time, and by degrees the healthy derma was invaded until the whole of the anterior half of the thorax became affected; nevertheless the general health kept fair. She died March,

1883, from an attack of diarrhœa and peritonitis, due in no way, as I believe, to the trouble in question, but idiopathic in character. No operation was asked for or advised by myself at any time; no autopsy. About the commencement of October, 1882, Dr. L. D. Bulkeley saw her in consultation, and he unhesitatingly confirmed my diagnosis; and recommended some palliative and antipruritic lotion, which she used for a little while, when it was cast aside as useless, as all other remedies had been before.

CASE II.—Rose M., æt. 49, married, childless, excellent family history, she presenting all the evidences of good health, came to my clinic in January, 1883, to show me her right breast, on the centre of which had been present for nearly three years a weeping, itching, and occasionally burning patch, in size about 2 inches by 3 inches, which had caused her great inconvenience, and for which she asked relief. The history of gradual commencement and extension from nipple, and the appearance were so marked and similar to the preceding case, that it would only be a recapitulation to give it in full; suffice it to say that Sir James Paget's description covers it exactly.

I told her that an operative procedure would be necessary for her relief, and strongly advised ablation of the breast on that side, to which she would not consent, but begged me to try and heal it by other means. I assented for the sake of gaining time, and as inducement for her to show herself at the New York Dermatological Society, which she did later. (See *Journal of Cutaneous and Venereal Diseases*, March, 1883.) Almost all the members present on that occasion advised ablation of the mamma; but this being objected to by the woman, a variety of escharotics were suggested; I selected the acid nitrate of mercury, but for other reasons than its powerful caustic action.

It was not until March 13, 1883, that she consented to an operation, which I did in the following manner: Having built up a dam by superimposed strips of Mead's surgical plaster, around and well outside of the periphery of the affected portion of skin, the patient lying as flat on her back as possible, and covering this plaster over with repeated applications of collodion, I almost poured on the escharotic till it formed a pool on the site of the "melted away" nipple, supplementing this also with superficial stabbing with an exploring needle. This caused extreme pain, which was well borne, the patient having refused an anæsthetic. After having allowed the escharotic full time for working, the surface was dried, and dressed in the usual manner, and she made an ordinarily fair recovery. One accident only supervened, and that an almost wished-for one: at the end of the third day a profound pyalism set in, which lasted more than a week. I had selected the acid nitrate of mercury with the hope that it might have such an alterative effect on the epithelium of the lactiferous ducts and acini by absorption as would be beneficial to the patient.

I tried to keep her under observation, but after the healing of the sore she seldom appeared at my clinic. At the time of her last visit, about a month ago, I noticed that while all the rest of the surface cauterized looked like ordinary scar tissue, there was still at the site of the nipple and immediately around it what appeared as if the old process was recommencing or still going on. The mamma under the parts treated has now a feeling of superficial induration, but I am not clear as to whether or not that may not be attributable to the hardened cicatricial tissue above. I still urge amputation of the breast, which she as steadfastly refuses. The only application made use of now is a little ung. aq. rosæ.

In conclusion, I will summarize what appear to me to be the diagnostic evidences of this disease :—

1. The subjective symptoms, itching, burning, etc., are those of an eczema, and not those of an ordinary carcinomatous affection, but they are more marked than in an ordinary case of eczema.

2. The objective appearances are like eczema; the discharge is absolutely similar to that of eczema; it stiffens linen, and forms crusts entirely undistinguishable from those of an impetiginous eczema. The colour of the surface is, perhaps, occasionally more livid, but the border is, in my opinion, not more sharply defined than is common in that trouble; the somewhat elevated appearance of the patch simulates exactly the acutely macerated and swollen conditions of the lower epithelial layers we so frequently find in eczemas. Sir James Paget compares the appearance to that of balanitis, an excellently apt illustration.

3. The disappearance of the nipple is spoken of by Henry Morris as a “melting away.” I have used the term two or three times, as it seems the best to describe its gradual obliteration; certainly nothing like rapid ulceration takes place in typical cases, scarcely what could be dignified by the name of erosion. It disappears.

4. The retraction of the nipple or tissues immediately beneath, if retraction there be, is not to be distinguished as such, as is so easy in ordinary cancer.

5. The “malignant papillary” feature, as described by Thin, was a marked element of my first case, but much less so in the second. It is a very diagnostic point, and would of itself, I think, instantly resolve any doubts as between Paget’s disease and a true eczema.

6. The extreme length of time may be noted in my cases before the appearance of anything like positive evidence of carcinoma. It will be noticed that Sir James Paget gives the limit as to this as two years. In my first case twelve years elapsed from the beginning of the attack to death, the latter event not seeming in any way connected with the skin lesion. In the second case considerably over the time mentioned by him has passed.

ARTICLE XII.

CASE OF FRACTURE THROUGH THE ANATOMICAL NECK OF THE HUMERUS, WITH COMPLETE SEPARATION AND DISLOCATION OF THE HEAD OF THE BONE INTO THE AXILLA, WITH ITS SUBSEQUENT REMOVAL. By THOMAS G. MORTON, M.D., Surgeon to the Pennsylvania Hospital.

JOSEPH W., aged 73, was brought to the hospital Nov. 22, 1882, with the history that while intoxicated he had fallen down stairs, but how he had struck was not known.

An examination showed discoloration and some swelling of the left shoulder, with preternatural mobility of the joint, but crepitation was not marked, a fracture through the anatomical neck of the humerus was readily recognized, the head of the bone was completely separated, dislocated, and driven into the axilla, where it formed a distinct tumor, which could be grasped by the hand, turned completely round, and its location easily changed. The question of permitting this portion of bone to remain in its unnatural position, or its reduction or removal by incision, was then considered. It seemed reasonable to infer that the head of the bone so entirely deprived of all source of nourishment, even if reduced would probably perish. Yet in the absence of evidence showing that the head of a bone so detached ever became a sequestrum, and the fact that even as complete fractures with separation and irregular apposition had been followed in many cases by more or less union, it was agreed, in consultation with my colleague, Dr. Agnew, that an attempt should be made to effect reduction.

After a number of vigorous efforts had been made without success, and having determined not to leave the head of the bone in the axilla, its removal was decided upon, and readily accomplished by a small incision at the lowest part of the axillary region.

The wound was brought together by silver sutures, and the arm was bound to the chest.

The patient was in a condition to leave the hospital on December 5th, but on the following day he was attacked with a severe diarrhœa, with great exhaustion, which terminated fatally a week later.

The line of fracture in the specimen removed was directly across the anatomical neck, where some capsular tissue remained attached.



The humerus subsequently obtained showed considerable absorption, and rounding off at the seat of fracture, but the joint was otherwise uninjured.

REVIEWS.

ART. XIII.—*Hospital Construction and Management.*

1. *Hospitals, Infirmeries, and Dispensaries; their Construction and Management.* By F. OPPERT, M.D., M.R.C.P.L. Second (English) Edition, revised and enlarged. 8vo. pp. xviii., 278. London: J. & A. Churchill, 1883.
2. *Hand-Book for Hospitals.* Issued by State Charities Aid Association. 12mo. pp. 263. New York: G. P. Putnam's Sons, 1883.
3. *The Relative Mortality after Amputations of Large and Small Hospitals, and the Influence of the Antiseptic (Listerian) System upon such Mortality.* By HENRY C. BURDETT, Fellow of the Statistical Society; Late Secretary and General Superintendent of the Seamen's Hospital, Greenwich; the Queen's Hospital, Birmingham, etc. etc. 8vo. pp. 41. London: J. & A. Churchill, 1882.

THE student of the history of hospitals and their construction must be struck by the remarkable fact, that medical men have had so little to do with planning and governing them. From the time when the control of European hospitals by ecclesiastics led to such abuses that in the 14th century they were put into the hands of laymen, in order that the sick might be better treated, and the Pope ordered in Italy that no physician should attend the same case twice without calling in a priest to watch over the safety of the soul of the sick person, until too recent times, the relation of the physician to the sick in hospitals has been embarrassed by an unaccountable prejudice on the part of their governors. A history of hospitals is too much one of perverse and uniform disregard of the correct principles which should guide their location, construction, and management.

These principles, as at present understood, were first treated with scientific accuracy by M. Tenon, a French surgeon, who, nearly a hundred years ago, pointed out the causes of the dreadful condition of the old Hôtel-Dieu, and laid the foundations of the pavilion system now being adopted. But the first building of the kind, the Hospital Lariboisière, was not completed till seventy years later, and this, with the new Hôtel-Dieu begun twelve years later still, in 1866, are costly failures. In utter disregard of the experience of a century, and the conclusions of the Surgical Society of Paris, and other weighty medical authorities, the Hôtel-Dieu was not only located in Paris, but the correct principles of construction were so distorted and misapplied, as to make it one of the unhealthiest of hospitals. It is lamentable enough that competent authorities should have so misapplied correct principles as to have made another costly failure in the new St. Thomas Hospital, completed so recently as 1871, but it remains true that the best hospitals and their good management must be expected to come from medical men, for they only best understand what is required.

The great wars of the last thirty years have marked an epoch of development of the modern system of hospital construction in each of the great countries of the world. In England, attention was aroused by the disasters at Scutari in 1854-5, and later Miss Nightingale's *Notes on Hospitals*, that cannot be overvalued, sustained by the reports of the Army Sanitary Commission, led to a reform; but the fault in the Crimea was entirely due to military mal-administration, and not to the medical department of the army, which had no effective control over its own affairs. Dr. Parkes then observed in Turkey an example of the value of one-storied wooden buildings connected by an open corridor, for the purpose of getting patients into the air.

The Prussian, Austrian, and Franco-German wars all taught instructive lessons, but to America, during the war of the rebellion, belongs the honour of having most largely and authoritatively developed some of the most essential principles of the new system of hospital construction, through a readiness to seize upon the best practical adaptation of means to ends. As soon as the earlier difficulties had shown the inadequacy of preconceived ideas, the medical department of the army was put into efficient control of all medical and sanitary matters. The principle was pushed to the logical result of recognizing general hospitals as military posts, and making the surgeons in charge their commanding officers, to whom the line officers attached to the hospital were subordinate. Such were the results that there could thereafter be no question that competency in such affairs belongs to medical men, and that their added professional knowledge of the requirements of the sick makes them most competent to direct the construction and management of hospitals. The authority of army medical officers, as sanitary inspectors, ceased at the close of the war, but was restored in 1874, and the final action on their recommendations was removed to a higher authority than that of the immediate superior. To Dr. Letterman, who was made Medical Director of the Army of the Potomac in the second year of the war, is due, more than to any other man, the credit of originating a system of medical administration unparalleled in simplicity, efficiency, and the magnitude of its operations. By his sagacity and success, he broke through the customs of service and military discipline, and opened the way for medical men to show that they were like other men in their capacity for administration.

To the lessons of the war is due the successful and growing influence of medical men in directing the construction and management of civil hospitals. Opposition to reform is apt to be inconsistent, and in this matter it has been, and unfortunately still is, most difficult to dislodge error grounded in tradition and prejudice. England gives a notable example of this in the slowness to adopt rational views in the management of her military and naval medical service, and in her civil hospitals, while the success of their adoption in the care of the insane is not excelled by any country.

During the last thirty years many new hospitals have been built, embodying correct principles with varying degrees of success or failure. While more permanency of construction has been employed than was advocated by some of the best authorities fifteen years ago, the tendency is to the simplification of the pavilions to those of one or two stories, and their more complete separation from each other; either without connecting corridors, or with only open ones.

In Germany the works of Dr. Esse marked an advance in the applica-

tion of the pavilion system, and it was fully carried out in the Berlin Hospital, completed in 1874, consisting of pavilions of one or two stories, entirely separated from each other, also about the same time in the Heidelberg Hospital. Germany is much in advance of France and more so of England in this matter. But in France has been recently introduced the most original and perhaps most important of modern modifications of the pavilion system, that of M. Tollet. This system is one of single-storied pavilions, built upon the plan of the Gothic arch to avoid stagnation of air, connected by open galleries, and warmed and ventilated without expensive mechanical appliances. The new army and navy hospital at Hot Springs, Arkansas, is to have two pavilions built upon this plan.

During the last ten years great advances have been made, particularly in England and this country, in the arrangements of sanitary appliances, for the removal of excreta, and the ventilation of drains and sewers.

The literature relating to hospital construction, and the sanitary questions pertaining thereto, have grown to be voluminous, and in examining the works now under review some special subjects will be noticed.

1. There have been three German editions of this work of Dr. Oppert's, besides this second English edition preceded by a first one in 1867, when it was said to be the first English work comprising a complete treatise on its subject. Part I. in eighty-five pages, or less than one-third of the book, treats briefly of construction and administration, and of special hospitals, with a few pages on workhouse infirmaries, dispensaries, and relief of the poor in their homes. There appears to have been little revision of this part of the book, for it reads as if written nearly twenty years ago, and is disappointing if one seeks for definite information on certain important points. The general statement of principles as to dimensions, site, plan, etc., is correct enough, but so brief as to lack completeness and clearness in some respects as to the author's opinions, and the few specific directions as to minor details of construction leave much unsaid that would be looked for in a complete treatise. For example, the essential features of the pavilion principle are stated, but there is a doubtful expression of opinion as to the most important requirement that they should never be more than two stories high and as to their connection by corridors. But as early as 1864 were issued the conclusions of the Surgical Society of Paris, that express the views still held by the most advanced reformers, declaring on this point that "the superposition of stories should be limited to two," and that buildings "should be completely isolated;" and as late as 1883, Dr. Oppert might have been expected to revise his reference to the Hospital Lariboisière. Instead of mentioning it as one of the principal representatives of the pavilion plan, of the merits of which further experience would have to decide, because the "expectations founded on theoretical deductions" had "not been quite realized" in that hospital, he might have stated the instructive and now generally accepted conclusion, that it is one of the illustrious examples of failure to properly apply correct principles in many particulars, viz.: as to height of pavilions, being three-storied, their nearness to each other, the internal sanitary arrangements, etc. An exceptionally full description of this hospital is given in the second part of the book, but it misses a condemnation of its real defects. The new Hôtel-Dieu is disposed of in half a page with no comment upon the important and instructive fact that it has grave defects due to well-recognized causes. This hospital, completed in 1876,

is mentioned in one place in the book as now in the course of construction.

The chapter on water-closets sounds strangely enough to an American reader. They are said to be in general use in England, in contrast with the common use of latrines on the Continent, and are approved by the author, "as there are no better means of banishing disagreeable smells from hospitals;" and it is said "the best means of ventilating them are self-acting windows;" and, as "the closets must have the windows open," because "there is no better prevention for bad smells than a low temperature," there is difficulty in protecting the water-pipes from the frost. There is no further word upon what has been learned in the last twenty years in regard to the construction and ventilation of these appliances. This chapter should have been revised to make it consistent with the descriptions of hospitals in the second part of the book.

The subject of warming is treated more at length, the German stove and the French calorifère are described, and a brief reference is made to the hot-water system, which is said to be the best. Little account is made of heating by indirect radiation, although its use is briefly noted in several instances in the descriptions of hospitals. In regard to steam heating, it is said, "we find hospital wards and corridors rarely heated by steam circulating in pipes, because this has been found dangerous on account of danger of explosions," etc. This method, being practically in universal use in this country, it will be inferred, of course, that this statement is based upon observations in European hospitals.

In regard to the size and shape of wards, arrangement of windows, etc., the now commonly accepted views are well stated. The subject of ventilation is treated with comparative fulness, and with a sufficiently precise statement of general principles, as to the amount of air-supply required, the reasons for it, and the means of testing it; but there is the briefest and most unsatisfactory allusion to the methods of heating the air, the size and location of inlets and outlets, and to the need of using a fan as "the only efficient means of forcing in air in the summer."

In relation to the government of charitable institutions, the author regards the system of centralization in Paris as having great advantages, but as not necessarily suitable everywhere, and he criticizes, no doubt with justice, the management of the hospitals of London by private corporations as sometimes discriminating against the admission of the most needy and suffering poor, an evil which governmental control might remedy.

As to "who should be at the head of a hospital," the author gives no uncertain sound, saying, "if there is one man at the head, it seems very natural that he should be a medical man." and after stating the well-understood reasons for this, he says, that "on the other hand, it is contended that medical men in general are bad business or administrative men;" whereas "in some German hospitals, and in many French provincial and Irish charities, a head sister reigns supreme, and in Italy a monk sometimes acts as director."

In the chapter on nursing the author does not represent the progress that had been made at the date of this edition of his book. The various kinds of special hospitals are discussed in ten pages in a general way. A seeker for information concerning lunatic asylums would need to consult special works on that subject.

A general view is given of the condition of lying-in hospitals, and the terrible mortality in them up to the date of 1866, with the conclusions

published in that year by the Surgical Society of Paris, but no allusion is made to the equally authoritative and valuable conclusions of the Society of Public Medicine in Paris in 1882. Small buildings are advocated, and a plan is suggested for a hospital of forty beds in small wards and rooms, but with water-closets badly placed and the ward for puerperal fever in the same small building with the wash-house, and the objectionable suggestion that two blocks may be omitted by building another one higher. No reference is made to late progress in this matter, and there is no notice in the book of the application of the Tollet system to a maternity isolation pavilion at the Hospital Lariboisière. There is no mention in the book of the Maternity Hospital in Paris (except in regard to the training of midwives), with its long history of unhealthiness, nor of Dr. Tarnier's successful work there in the last decade, nor of the noteworthy success of the Pavilion Tarnier, a small building of two stories, with entrance to each only from the outer air, and with walls, floors, and ceilings made non-absorbent. No reference is made to the remarkable results obtained from investigations of this question as relating to the English work-houses in 1867, and later years, showing immunity from disaster to puerperal women in the lying-in wards equal to that in the country at large, and proving that women may be confined in public institutions without undue risk. After a brief description of the organization of public dispensaries the first part of the book closes with a notice of the methods of administering relief to the sick poor, at their homes, in different countries.

The second part of the book is said, in the preface, to "contain many additional descriptions and also new illustrations of hospitals recently constructed." It is made up of brief descriptions of a large number of hospitals, more than two hundred, in nearly all parts of the world, with seventy illustrations, most of them being outline plans of the whole or parts of hospitals, occupying, in many instances, a full page of the book. The descriptions are necessarily brief, but are concise, and point out the peculiar features of each hospital. The lists, etc., of hospitals of some countries seem to be quite complete; of others, partial, meagre, erroneous, and much out of date. For example, American hospitals are disposed of in seven pages. "The splendid Johns Hopkins Hospital" is referred to in seven lines, which is well enough, as it is unfinished, but in saying "an administration block is connected by covered ways with the other buildings," a wrong impression is conveyed as to the degree of their practical separation by an ingenious device permitting entrance from the outer air, even to upper wards of the two-storied pavilions. The Massachusetts General Hospital, which has some modern features that are unexcelled, is not mentioned. The Boston City Hospital is described in less than one page, with no notice of its being entirely remodelled and extended subsequent to 1875; while another paragraph and a half-page plan is devoted to the "Boston Free Hospital," an unadopted original name and plan for the first-mentioned institution. The book is interesting and valuable chiefly for its historical character, and for the information it gives of old and well-known hospitals, as showing what is to be avoided in the construction of new ones. It would have been interesting if the date of the building of each one had been given in all cases instead of a few, and valuable as marking the progress of improvement in construction. It is apparent, however, that England has been slower than others of the leading countries in adopting fully the principles of the pavilion system, as there are still being built there the

costly three-storied and even double pavilions, connected by closed corridors, a point in which countries less favoured in regard to climate have done better. The author seems really not to have accepted or appreciated the importance of the more advanced views, and fails sometimes to notice the presence or absence of essential features of the pavilion system in some of the most noted examples of modern hospital construction which he describes. Two noted French hospitals have been already mentioned as not having the causes of their defects pointed out, and, on the other hand, no mention is made of the Tollet system, novel and valuable as it is thought to be, tested by its application to barracks and schools, and its successful use since 1879 in a military hospital of twelve pavilions, which is only briefly noticed in this book in these words: "There is a new military hospital at Bourges, Paris, which possesses one-storied pavilions." A similar failure is made to call attention to the contrast between the prevailing English method and the excellent features of another and newer example of the Tollet system in the Montpellier Hospital, and the same is true in regard to the new Berlin and other German Hospitals, as to their being only one- or two-storied. It is further to be noticed that extreme brevity of description in many instances reduces the enumeration of minor appliances to mere catalogues, without conveying an idea of their construction, and for the same reason, in many cases, no definite information can be extracted upon so important a matter as the methods of heating and ventilation.

This book is not of the nature of a manual, and to one who has only moderate knowledge of hospital work and construction, it would be of much less value than to one familiar with such work, who could find in the book valuable hints and general information not to be found elsewhere, and who would understand by brief mention much that is unexpressed. The plan of the book is an excellent one, and while it is to be regretted that it was not more expanded and modernized in the last edition, it is still a useful book, and should be in every hospital library, and would be of value to any one interested in the subject.

2. This is a second edition of a manual "prepared in 1877, for the use of those members of the State Charities Aid Association, whose duty it is to visit public hospitals in New York County and other counties of the State." The work having been "carefully revised and enlarged, is offered to the public, and especially to all persons concerned in hospital work, with the hope that it may prove helpful and suggestive." It is an excellent book, and as such a manual should be, is convenient in size, well printed, and though it has only 260 pages, including appendix, they are well filled with information, useful because it is precise, and tersely and instructively expressed. It serves another excellent purpose not mentioned in the introduction, and has been practically used as a manual for the instruction of nurses in training schools on subjects treated in some of its chapters.

In the chapters of "general suggestions" and on the "hospital building," the correct principles of construction are well and fully stated with much detail. What makes a hospital healthy and unhealthy, and particularly the section on hospital infection, including a quotation from Mr. John Simon, is a condensation of much in little. It is declared that "the approved plan requires one-story wards, the ground beneath being coated with asphalt or other smooth dry surface;" that "there must be nothing within the four walls except the patients, their beds, tables, and chairs; the water-

closets and service-rooms, the drainage pipes, and whatever is necessary to make each such ward almost an independent hospital, being built outside of it." Two-story pavilions should have their wards separately ventilated. Connecting corridors when the climate requires them, are either entirely open or are well aired by side sashes, and never lead directly to the ward, but into the annex or service building.

It is well that for cold climates an exception is made to the extreme statements that the building should be "raised on piers or arches that the air may circulate freely, and be built with a view to being torn down if after a few years they prove infected; and that the roofs should be preferably ridge-ventilated, and the ceilings finished on the rafters, not plastered." Comfort and economy rightly demand consideration in the colder climates, and the best authorities are disposed to accept the later view that more permanent buildings may do as well as the temporary ones that did so good service during the late war. The basement spaces may be closed by substantial walls, in which, however, there may be abundant windows that can be open in summer. Hollow walls of brick plastered on the inside, and properly finished ceilings, subserve comfort and economy in regard to cost of reconstruction as well as of heating in winter. The scraping off and renewing of plastering every ten or fifteen years are more likely to be done than the tearing down and rebuilding of a pavilion ward, even though its cheap construction may have rendered it uncomfortable to live in and expensive to properly warm. The main defect of the Boston City Hospital one-story wooden pavilions, covered with corrugated iron, is that they are sometimes uncomfortable in extreme cold and windy weather in winter, even though they have an extraordinary supply of heat by indirect radiation, by steam apparatus capable of furnishing in winter weather an average of 8000 cubic feet of air per head per hour.

Square wards with fireplaces, air-shafts, etc., in the centre, are admitted to have a pleasant aspect, but they should not be more than thirty feet square. It is well said that small wards, of two to six beds, are objectionable in working a large hospital, as increasing labour and cost. A few such rooms are useful, but as a rule a ward should be twenty-eight to thirty feet wide, two to four times as long, and fourteen or fifteen feet high, with opposite windows, one for every two beds in medical wards, and one for every bed in surgical wards. Eight and ten feet of wall space per bed is said to be necessary, but a minimum of seven feet is accepted by some authorities as sufficient for large and well-arranged and well-ventilated wards, giving about one hundred feet of floor area, and about fifteen hundred cubic feet of air-space. Larger air-space by increased height is of no advantage. Surgical wards may well have more space for each patient. Tents for summer, and isolating huts are properly commended; but mention is omitted of the excellent isolating wards, with single rooms, of the Massachusetts General Hospital, and the perfected plans for similar buildings at the Johns Hopkins Hospital.

The management of the air-supply, heating, and ventilation are treated with sufficiently precise directions as to various methods, the effect of different locations of inlets and outlets, their size, etc. Open fires are considered most desirable, but, as requiring to be supplemented by indirect radiation.

The chapter on drainage and water-supply, including the arrangement of water-closets, lavatories, soil-pipes, and all such appliances, with reference also to the simpler conditions of a country hospital, is an admirable

condensation of the latest knowledge on these points, and there is little of importance to which attention is not called. The management of the hospital laundry is treated with the careful attention to all its details that its importance deserves, including the care of clothing from their use in the wards, through all the necessary processes, until returned there, and the proper disposition of articles requiring disinfection or destruction; and the duties of all persons concerned are clearly and instructively detailed. The management of hospital housekeeping, a most important matter, covering details of control and discipline of employés and all included under the duties of matron, is set forth understandingly and well. The gospel of cleanliness is preached with much power of exhortation.

One of the most important chapters of the book is that on the nursing service. It is a manual of nursing in itself, with its exhaustive enumeration of all that pertains to good nursing. The graphic description given of the order of duties for a day in a well-managed ward is pleasing and instructive. Promptness, discipline, cleanliness, good order, patience, and gentleness are the cardinal virtues in this matter, and to these may be added vigilance and *unexpectedness* of inspections. A head nurse, or superintendent of the training-school, is the proper responsible head of this service, and it is wisely recommended that to her shall be subordinate the matron as head of the housekeeping department, or if this is not the case, as in some hospitals, each should report to, and take their instructions from, whoever is their immediate superior. In small hospitals, the two offices may be combined in a competent person. Some good things are said in relation to the care of the insane, and the evils of poor-house management are referred to. Authorities do not agree however to some of the statements here made, for example that there should be no inclosed airing courts, for large inclosed gardens are a source of comfort and a sense of freedom to many persons who might otherwise have to feel that they are constantly and personally watched. The subjects of maternity wards and village hospitals are briefly but effectively treated, and the chapter on disinfection is admirable, relating to clothing, beds, wards, and all their appurtenances, and to the removal of sewage. After some valuable concluding remarks, an appendix contains specific directions for constructing an isolating cottage prepared by Dr. Wylie; a list of articles required for an outfit of a twenty-bed ward; a series of hospital rules and regulations that have been in practical and successful use; the instructions for disinfection, issued by the National Board of Health; and other matters.

The plan of the book is peculiar. By a little change of terms it would be most fittingly addressed to hospital officers instead of visitors. In its comprehensive treatment of all matters pertaining to hospital management, in its well-defined statement of the duties of subordinate officers, as well as of nurses and other persons it is a valuable manual for any superintendent, of whose important functions, however, little is said in the book, although his field of responsibilities covers all that is written in it. A few paragraphs in the last pages (except what is said of medical superintendence of the insane) state in general terms the importance of good superintendence and the proper division and grading of responsibility, but one who has had practical experience in such an office, and knowledge of its cares and difficulties, must be struck by an apparent defect in this otherwise excellent book that might be productive of error and trouble through interference of authority. It reads as if written from *outside* of a hospital, but by one who has had practical experience *in* such an institution. Hos-

pital government is essentially patriarchal in its character ; its head should be, in its fullest and best sense, the head of the household or family. The more perfectly this principle of government is carried out, the better the superintendent is proved to be. All that conflicts with this is obstructive, and it is the first duty of inspectors to remember that they are to aid him. This book was written for official hospital visitors in New York, and "women visitors are chiefly addressed." It is claimed that woman's sphere should be greatly enlarged by furnishing a "field for the exercise of her organizing skill and intelligence, not only as visitors, but as managers and officers," and members of higher boards of supervision of charitable institutions. All this may readily be granted, but it is too much to say, that "it has come to be recognized that the specific duties of nursing are only properly performed when this branch of hospital service is under the direction of a committee of women," and not wise to say, that "all the domestic affairs, as well as the nursing, might very wisely be placed under the control of women, two or three of whom could be added to any existing board of commissioners or managers for this purpose, with the title of House Committee." The whole subject of planning and erecting new hospitals and altering old ones is discussed, as a matter belonging to visitors and committees, with no reference to the superintendent ; and in one of the three instances in the first half of the book in which this officer is casually mentioned, it is said, in regard to the difficulties of heating and ventilation, that they will be much simplified "if the superintendent is intelligent enough." There is much in the tenor of the book that implies direct responsibility of subordinate officers to visitors and managers and the propriety of their direct control. It is not enough even to avoid implying this. The condemnation of it should have been positive. A good superintendent would only welcome the intelligent inspections and helpful advice of women, as official visitors, and as members of a board of management, but he would righteously pray to be delivered from the woes that spring from any interference with household government, either by women or men. All honour to those who did the pioneer work of introducing reforms and good nursing into poorly managed hospitals, the women and men, *including physicians*, who have nobly engaged in it. The work of reform will not be completed till all is done that can be, to promote the unity, as well as to improve the quality of hospital government, for this begets harmony and removes friction.

Training schools and the nursing service of hospitals are being successfully carried on entirely under the management of the hospital authorities, which greatly simplifies matters. Under this plan the skilled services of trained women can be had for the efficient management of all departments that can be placed under their charge. A medical superintendent, better than any other, would appreciate the quality and value of such services. But while both methods may continue to be successful, and each may have its special advantages, the earlier and separately incorporated schools should not rest upon their own successes, but should lend their influence to carrying on the work in the interest of good hospitals, to the perfecting of the superintendence, with which they should strive to harmonize as a first law of good government.

In the earlier stages of the reform there was a natural antagonism between the schools and the authorities of some hospitals, and there is danger that the momentum of success may carry the former into fixed habits of antagonism on questions of authority that will obstruct or limit

progress. It may even now be said that the graduates of certain training schools can be distinguished by a characteristic want of appreciation of the regard due the authority of the superintending head of a hospital. Perhaps this evil and many others would be cured if the character of the superintendencies could be elevated. Every hospital of any importance should have a medical superintendent, an office from which a woman physician should not be debarred, who, if well chosen, could harmonize difficulties better than a layman. To such a superintendent an incorporated school should readily yield all points of authority needful to the attainment of the greatest good, even, if need be, to the abdication of the outside school organization, its special missionary work having been accomplished.

If clerks, grocers, machinists, sea captains, and city politicians can be thought to have fitness for hospital superintendencies, certainly other men may have at least equal administrative capacity, even plus a medical education. According to the bias of a board of managers, the buying of supplies, the care of the steam apparatus, or quarter-deck discipline, etc., may be deemed the most important requirement, whereas these matters of subordinate departments need to be harmonized and suited to the one main purpose of curing the sick, and this can be done best by a medical superintendent. The office should be dignified with all the professional duty possible, not including the treatment of the sick, and if one medical man fails another should be tried, for it is pitiful to see a retrograde movement in this slow-moving reform of hospital construction and management. It would be interesting to know how the great influence of the independent nursing-schools is being exercised on this point.

On one of the last pages of this book it is said, of what makes a good hospital, "the factors are, clean air, clean water, plenty of clean bedding and clothing, well-cooked food, enlightened medical care, trained nursing, and a pure and cheerful moral atmosphere; above all, and including all, skilled, honest, intelligent, humane superintendence." This is admirable, and makes amends for much in the preceding pages left undone that ought to have been done in a work animated by so high a purpose as this, but there remains the one defect of this excellent book, for the opportunity was neglected of giving potent aid by pronounced declarations in favour of medical superintendencies and unity of management, which the progress of hospital reform is obviously tending to establish. On the whole, it is to be said that this useful book marks the decided progress of recent years in the cause which it supports.

3. In Mr. Burdett's first edition of his work on Cottage Hospitals, in 1877, he published some statistics of the results of amputation in sixty-one of them, having an aggregate capacity of 553 beds, showing a mortality of 17 per cent. in 326 cases. These results were applied to sustain the well-known views of Sir James Y. Simpson and Prof. Erichsen on this subject. The former found an average mortality in town hospitals of 41.6 per cent. previous to 1868, while in a period of thirty-eight years prior to about the same date, Mr. Erichsen found a mortality of only 25.7 per cent. from all amputations performed in the University College Hospital. As a contribution to the heated controversy on the question of the inherent unhealthiness of large hospitals, described as "hospitalism," Mr. Burdett gives, in this book of forty-one pages, the result of a long and painstaking analysis, as shown in his tables of 241 cases of amputation

in cottage hospitals, showing a mortality of 18.6 per cent., a result of 7 per cent. in their favour. It is not the present purpose to follow the discussions of this question, as to the many differences between town and country, large and small hospitals, relating to the condition of the patients, and their surroundings and even to the operators themselves, that have greatly complicated the subject. The matter has been complicated still more by the inferences drawn from the use of Lister's antiseptic system leading the writer to declare "that where this method of treatment is carefully enforced, the size and condition of the hospital buildings are of comparative unimportance." This is based on the statistics of Schede, of Hamburg, who is said to have proved "beyond dispute that Mr. Lister, by his wonderful discovery, has enabled the surgeons who adopt it conscientiously, irrespective of the size of the hospital buildings, to reduce the mortality in such cases to 4.36 per cent." But there are Mr. Callender's 44 consecutive amputations at St. Bartholomew's with only one death, and 100 at Pennsylvania Hospital with 17 per cent. mortality, all without "antiseptic" treatment; and there are Mr. Wells, Mr. Keith, Mr. Tait, and others, for and against antisepticism. Moreover, there are other septic influences in crowded or ill-ventilated wards, that increase mortality, other than those that can be destroyed by Listerism; and in regard to statistics themselves there may be many fallacies; the groups of cases compared may contain different proportions of thigh, leg, and arm amputations; new and old hospitals cannot be fairly compared; and error may arise from comparing statistics of the last twenty years with those of the last forty years or more, as in this book, whether hospital hygiene was formerly better or worse. It is not probable that this inquiry will ever be further advanced by an agreement upon scientific data in regard to amputations, and it is therefore reasonable to accept the general impression they tend to convey, of the importance of good sanitary conditions and no over-crowding.

The study of the works noticed in this article impresses one with the fact that great progress has been made in the art of keeping hospitals clean and healthy, and it needs no more proving to show that sufficient room and fresh air are necessary to prevent either sick or well people from poisoning each other by their neighbourhood. Practically there should be no hesitation in following the plain indications, in the direction of simplicity of construction, cleanliness, and good management of hospitals.

Mr. Burdett's excellent work in the interest of cottage and other hospitals, and his large experience in management have taught him that laymen realize far too little the importance of having good hygienic surroundings. It is a part of his purpose in this book to give instruction on this point to laymen who are philanthropically and influentially engaged in such work, and his successful labours in this direction, as well as others, entitle him to warmest commendation and gratitude.

E. C.

ART. XIV.—*Saint Bartholomew's Hospital Reports*. Edited by W. S. CHURCH, M.D., and JOHN LANGTON, F.R.C.S. Vol. XVIII. 8vo. pp. 493, 81. London: Smith, Elder & Co., 1882.

THE first paper in this excellent volume is *On Fitful Recurrent Vomiting*. The author, Dr. SAMUEL GEE, relates the histories of nine cases

which he has collected in his private practice, or in the wards of the hospital. Its study presents an important page to all interested in diseases of childhood. These cases seem to be all of the same kind, their characteristic being fits of vomiting, which recur after intervals of uncertain length. The intervals are free from signs of disease. The vomiting continues for a few hours or a few days. When it has been severe, the patients are left much exhausted. "The oldest of the patients was only nine years, and in four of them the disturbance commenced in early infancy. Abdominal pain is often present, and sometimes so severe, that the vomiting presented itself as a secondary symptom. The condition of the bowels is not characteristic; in fact, the evidence of the disturbance of the digestive function, except in a secondary manner, is almost wholly wanting. The surrounding states and circumstances, which may be looked upon as proximate causes, are not constant."

It is a striking feature in more than a majority of the cases, to which Dr. Gee does not allude, that one, or sometimes both parents of the young patients have been the subjects of severe headaches or megrim, or else that the attacks of vomiting were likely to result from causes similar to those which in adults are seen to result very frequently in periodical headaches with vomitings, etc. It is very possible that a more extended observation of similar cases in children would show pretty conclusively that these vomiting attacks are in reality neural disturbances or discharges, comparable to those found in adults suffering from hemicrania, megrim, or "sick headaches."

In the treatment of these cases, the author has found it sufficient during the attacks to restrict the diet to water, barley-water, or weak meat broths, and to give calomel, or a similar preparation, in small doses of one-fourth or one-sixth of a grain at frequent intervals. To prevent the attacks, when the forebodings of their arrival can be detected, the compound decoction of aloes is administered in doses of one to four drachms; this is especially recommended if the bowels are costive or the fecal matter is whitish in colour, as occurs in some of the cases.

Dr. J. WICKHAM LEGG contributes a *Note on the History of Exophthalmic Goitre*, which is devoted to the consideration of the author to whom we owe the earliest recognition of the condition which we speak of as Graves' or Basedow's Disease. As the author says, it is to Stokes to whom we owe a great part of our present knowledge of the various clinical features which are comprised under the term Exophthalmic Goitre; and it was Stokes who pointed out the earliest as yet discovered observation of this disease, made by an English physician named Parry. The latter's writings date from the end of the last century, but were published posthumously in 1825. In Parry's writing, under the head of "Disease of the Heart," he describes eight cases of simultaneous enlargement or palpitation of the heart and enlargement of the thyroid gland, but it is only in his first case that he mentions the protrusion of the eyeballs.

The date of Parry's observation of this early case is 1786, and the next undoubted case which Dr. Legg has been able to find is an anonymous one published in the *Medico-Chirurgical Journal and Review* for 1816 (vol. i. p. 179). Several other early cases have been referred to by Virchow, Basedow, and others, but in general they can be spoken of as deficient in some one or other of the characteristic symptoms.

Dr. Graves, of Dublin, published the first connected account of the disease in the *London Medical and Surgical Journal* for 1835, in the form of

a clinical lecture, and from this early description, and its republication later in his "Clinical Medicine," his followers and fellow-workers christened the malady with his name. There seem to have been serious doubts with many, especially in Germany, about the priority of Graves's observation and description of exophthalmic goitre, but without justice. The error and confusion have apparently arisen from the fact of there having been two series of the journal in which his lecture was published running at the same time, and his account was printed in one series only.

Von Basedow published his account in Casper's *Wochenschrift* in 1840, under the title "Exophthalmos durch Hypertrophie des Zellgewebes in der Augenhöhle." Dr. Legg thinks from a study of Von Basedow's paper that this author "took a retrograde step rather than one in advance, fixing the attention upon the prominent eyes, and leaving the heart and the thyroid too much in the background." Von Basedow made most prominent the exophthalmos, of which it is true Graves spoke only incidentally. The former of these observers emphasizes the changes in the eyes and proposes the name of *Glotzaugen-cachexie* for the disease: he seems never to have grasped the threefold character of the symptoms, and his picture as compared with Graves's appears distorted and one-sided.

Marsh had, at quite as early a date as Von Basedow, laid due stress on the prominence of the eyeballs in connection with cardiac palpitation and enlargement of the thyroid gland. His remarks before the Pathological Society in 1840, the date of Von Basedow's publication, include a description of the condition of the heart and thyroid, which Graves had previously delineated, and he adds "that, in a majority of these cases, there was a remarkable prominence and protrusion of the eyeballs, so as to give to the group of symptoms by which this disease was characterized a very striking feature."

Dr. Legg concludes his paper by the remark that "if we are to search for the true founders of our knowledge of exophthalmic goitre, it seems that we must look to Dublin—to Graves, to Marsh, and to Stokes; not to Merseburg."

The paper is a very interesting one, showing the growth of our knowledge of this peculiar malady, and will be found useful to any one studying the historical portion of this disease. Much of the information it contains is difficult to come at.

The paper of VINCENT HARRIS, M.D., on *The Diagnostic Value of Cardiac Murmurs* is a brief one; in it there is much material for careful consideration on which further elaboration could be expended with advantage. The author has evidently devoted much thought to his subject, and has given us a very clear estimate of the present condition of medical knowledge. We wish that he had gone further—and we hope that he will on some future occasion—and give us the true relative bearings which the diagnostic value of cardiac murmurs has to the subject of their treatment, provided he will examine the question with the same eyes and from the same point of view with which he has examined this subject.

The object of the paper is "to draw attention to the various ways in which, without great care, it is possible to fall into error, when auscultatory evidence is alone relied upon in diagnosis of the valvular diseases of the heart," "without in the slightest degree wishing to call into question the value of the auscultatory phenomena of heart disease."

The author speaks first of the historical aspect of his subject, of the vagueness of knowledge before the employment of the stethoscope, of the

enthusiasm of Laennec and his immediate followers concerning the certainty of diagnosis of all heart affections by the method of mediate auscultation. It is evident, from a careful study of Laennec's work, that the conclusions which he arrived at from the employment of his "universal" method of diagnosis are less generally correct than those from inspection, palpation, and the general symptoms.

The sober judgment even at that early day was that, in order to arrive at correct results, other methods besides the stethoscope must be employed, and above all that the general symptoms must be compared coincidently with such indications. And this wise conclusion we believe holds to-day universally, although perhaps some might be led to conclude otherwise from a perusal of some recent hand-books on auscultation. We feel quite sure that the idea of a beginner in the art of auscultation and the impressions of a medical student fresh from the clinic too frequently are that a murmur indicates heart disease unequivocally.

The latter half of the paper is devoted to the consideration of the two chief ways in which mistakes may arise in the diagnosis of heart disease, when too great reliance is placed on the existence or non-existence of a cardiac murmur, viz., valvular disease without a murmur, and cardiac murmur without valvular lesions. This part of the paper is codified under two general headings with subdivisions. The first class is heart disease without constant auscultatory signs, and this is subdivided according to the respective valves and the murmurs which are heard at each orifice; cases illustrative of the varying conditions are given along with the opinions of various authors, and the whole is followed by a concise and very satisfactory summary. Under the second class of cardiac murmurs without valvular lesion are given the usually recognized sounds which are spoken of as inorganic or functional.

It would seem, from the facts and opinions derived from this paper as well as from other recent sources, that the whole subject of cardiac valvular disease, and especially the dicta which we now hold in relation to its auscultatory signs, need a thorough revision.

Clinical Observations on the Larynx in Phthisis. By J. A. ORMEROD, M.D.—The question of the condition of the larynx in tubercular disease of the lungs has recently excited considerable interest in general medicine, although the subject has much longer been under close observation by specialists devoted to the region. The interest has been one connected not so much with the therapeutic as with a diagnostic aspect. It was thought at one time that a study of the appearances of the larynx would furnish the clue to the condition, or perhaps the character of the lung disease. Most of this interest has subsided recently to a great degree for various reasons; part of it has been swamped in the overwhelming question of the parasitic causation of tubercular disease in general. In the next place it has been shown to be very difficult—in many cases impossible—definitely to decide what lesions of the larynx are tubercular, at least in their earlier stages. Occasionally tuberculosis is found in the larynx and surrounding parts before the lung or other organs are affected. The lung disease ordinarily is well developed before the larynx shows unmistakable signs of tubercular deposit, and of course it very frequently happens that phthisis pulmonalis is far advanced, and death occurs without the larynx showing anything amiss. Even when lesions are found with the laryngoscope, in any grade of phthisis cases, they are far from typical of tubercle. A positive diagnosis can generally be made from the lung conditions, pro-

vided they are present, sooner than from the larynx. It is for these reasons, among others, that the condition of the larynx is of so little comparative value in deciding the nature of the lung disease, and affords so little help in the earlier stages for diagnostic purposes. Therapeutically the problem seems to be a very hopeless one, and the results of treatment are most discouraging. One is almost ready to subscribe with limitations to the saying, "When a disease of the larynx does not get well under treatment, it is tubercular, and when it recovers, it is not."

In this paper Dr. J. A. ORMEROD gives the results of the examination of 100 cases of phthisis taken at random from his out-patients at the Victoria Park Hospital, "whether the patients presented laryngeal symptoms or no. It was thought that such a series would illustrate the frequency with which the larynx is affected in this disease, and afford some insight into the slighter affections which may be presumed to precede the development of severe laryngeal phthisis."

The author gives details of his cases in tabular form; the first table contains twenty-five cases in which the larynx was unaffected by any changes. Thus, in about one-fourth the cases, the organ was not diseased, but in most of these patients the lung disease was slight. Although this number seems small to the author, the proportion is about that given by others.

The second table includes those cases in which only or principally the vocal cords were affected; for the most part the changes consisted of congestion, with thickening, but none of the cases presented the well-marked granulations, described by Stoerk and others, which subsequently undergo a peculiar ulceration. The changes in the cords appear to be of slight importance, except for the hoarseness which comes from them. Hoarseness, even aphonia, may be present without lesions of the vocal cords, in consequence of pressure on the recurrent laryngeal nerves.

The next table comprises affections of the ventricular bands, and anæmia of the larynx. This anæmia is not unfrequently conjoined with ventricular band disease, and the condition is sometimes curiously limited to this region. The anæmia has been looked upon as a forerunner of phthisis; hence the significance it has acquired in tubercular disease.

Table IV. relates to the changes in the aryteno-epiglottic region which, as is well known, is frequently affected in phthisis. These folds present as pyriform tumours with their bases downwards towards the median line; this is the appearance, says Mackenzie, which is found in by far the greater number of cases, and when found is characteristic of laryngeal phthisis. These were found by the author in 16 cases of the 100 in which the arytenoids alone were affected, and in 14 others these were affected along with other parts.

The inter-arytenoid region is a very interesting part, and this is treated of in Table V. The gradual development of a tumour arising from the posterior wall and extending forwards covered at first with intact mucous membrane, but subsequently ulcerating, has been regarded as absolutely characteristic of tuberculosis. Tubercle alone makes a tumour in this region, and although the parts may swell from acute inflammation the swelling from tubercle differs from this in that no pain is caused, and even the voice may remain unchanged since the tubercle is deposited below the level of the cords. Stoerk says that the growth may be observed before the physical signs in the lungs can be detected.

Tables VI., VII., and VIII. include more general affections of the various parts of the larynx, subacute laryngeal catarrh, and general tuber-

cular infiltration, and include about one-fourth the whole number of cases, of which the latter group furnishes five cases.

From a general review of the cases, it is evident that in phthisis the larynx exhibits some one or other change, if we include the slight and non-specific lesions as well as the tubercular, with extreme frequency in the phthisical. The posterior part is most frequently affected, and the epiglottis escapes except in the extended acute inflammatory changes; congestion is far more common than anæmia. The symptoms connected with the larynx are not unfrequently disproportioned to the lesions which are to be seen with the laryngoscope, hence it seems important to determine by examination the condition presented before any inference is drawn from them. Hoarseness may result from even the simplest changes, or there may be an ulcerative destruction of the whole or part of a vocal cord. Pain in swallowing is a much more significant sign, since it nearly always points to an affection of the arytenoid region, or to tubercular deposit and ulceration of the epiglottis.

Mr. HENRY T. BUTLIN, under the title *From the Department for Diseases of the Larynx*, gives an account of the origin and progress of this special department of St. Bartholomew's Hospital. This work includes diseases of the throat and nose, and was inaugurated in 1878.

The author speaks of certain groups of cases which have presented themselves; first of enlarged tonsils, and their removal. He says that 150 tonsils have been removed since January, 1881 (from a large majority both tonsils were removed, although this number does not show the number of patients treated). He also says that the tonsils are not removed *merely* because they are enlarged, but because they are producing symptoms. This seems a large number of tonsils requiring removal out of so small a total of patients, less than 300 during the year. The author recommends the use of Physick's guillotine, as the best instrument—it being simple, strong, and easily kept in order; and when this instrument is inapplicable, or cannot be applied, the guarded bistoury is to be employed. The operator uses anaesthetics if necessary for any reason, and speaks favourably of nitrous-oxide gas.

DRS. T. LAUDER BRUNTON and THEODORE CASH give the results of their experience *On the Action of Various Alkaloids on Processes of Oxidation*. Their research was conducted in two series: the first by the comparison of the actions of different alkaloids; the second by the comparison of various salts of the same or nearly allied alkaloids on the processes of oxidation. In the first series thirteen alkaloids were compared, viz., aconitia, atropia, caffèin, cinchonine, codia, conia, digitaline, morphia, nicotia, picrotoxine, quinine, strychnia, and veratria. "In each case the influence of the drug on oxidation was tested by ascertaining its effect upon the oxidizing power of the vegetable protoplasm of the potato and the oxidizing power of the blood."

The next paper is an interesting one by Messrs. WALTER H. JESSOP and OSWALD A. BROWNE on *Hemiatrophia Facialis*. They give the details of two cases of this rare affection; the first of a girl, aged twelve, in whom the disease commenced five years previously. The left half of the face and head was much altered, and slightly also the upper part of the left chest; curiously, too, there was a strip of superficial atrophy affecting the middle and part of the ring finger of the opposite or right side of the body; the second case concerns a woman aged forty-eight, who had been affected since she was two years old; there was atrophy of the half of the tongue in this case.

The authors give a brief *résumé* of some of the important cases which have been recorded by others (45 in all), and also of the various theories which have been advanced to account for the alterations. They uphold the theory of trophoneurosis, as put forward some years ago by Romberg, the sympathetic, however, playing a prominent part by its intimate connections and conducting strands.

Mr. DAVID A. KING gives some results of *An Analysis of Seventy Cases of the Typhoid Epidemic of 1881-2* that occurred in the hospital. The investigation is confined "to an examination of a few matters upon which less uniformity prevails" among the many phenomena of typhoid fever. "The first point investigated was the influence exerted on the course and termination of the disease by the period of its duration at which the patient was admitted to the hospital." This question has been reported on in relation to several diseases. In *The American Journal of the Medical Sciences* for 1837, Drs. Gerhard and Pennock showed the influence of late admission in typhus fever to be very unfavourable, and at the same time very striking.

The author's work is arranged in a series of tables which very clearly indicate that in typhoid fever this influence is equally unfavourable. The effects of late compared with early admissions show increased death-rate, prolonged duration of the disease, a greater tendency to relapse, and increased severity of the symptoms and increased number of complications. This is the result which, *à priori*, would be expected; the surprise is that the percentage of the evil result is not greater than stated. Perhaps the unfavourable showing is modified and lessened in this epidemic as compared with other outbreaks or isolated cases by the fact that, in the epidemic dealt with, there was a striking absence of diarrhœa.

Mr. LAWRENCE HUMPHREY furnishes *Some Observations on the Tubercle-Bacillus in Lung Diseases*. He prepared his specimens by Ehrlich's method. The results obtained corresponded in great measure with the observations of others, as derived from the examination of the sputa and scrapings from the caseous masses in the lung.

Dr. NORMAN MOORE contributes some *Pathological Observations on the Pancreas*. The details are given of a case of thrombosis of the pancreatic veins not followed by abscess of that organ; of two cases in which, with thrombosis of the portal and other veins, the vessels of the pancreas were free from involvement. The author has found, in correspondence with the observations of others, that the pancreas usually remains without infiltration in cases of lardaceous (amyloid) disease of the organs; he gives a record of one case in which the reaction to the iodine test was visible in the organ in conjunction with the general wide-spread visceral infiltration throughout the body. The paper also calls attention to changes taking place in the pancreas in conjunction with and of similar kind to cirrhosis of the liver; in these cases it is probable that the involvement of the pancreas increases the impaired digestion due to the alterations of the liver and its function.

Drs. SAMUEL GEE and JOHN ABERCROMBIE report *A Case of Lesion of the Sympathetic Nerve of the Neck*. The disease was due to sarcomatous tumours surrounding the bodies of several of the cervical and upper dorsal vertebræ. The diagnosis was not made during life, as the fluctuating masses were looked upon as due to caries of the vertebræ. Many of the symptoms varied from those usually described in maladies of this nerve, and the authors concluded that the diagnosis could perhaps have been

arrived at from closer attention to the ocular symptoms—viz., the slight ptosis and the condition of the pupil, together with the other phenomena.

Dr. SAMUEL WEST contributes a short article on the relation of *Pain and Hemorrhage*, which is interesting, and the experience given corresponds probably with that of every observer. His cases are arranged in two groups—viz., pain preceding hæmatemesis and pain preceding hæmoptysis. He says of the first group, that “we are tempted to refer the pain in these cases to the extension of the ulceration, but this will not explain the striking and persistent relief which the bleeding gives to the pain.” The pain of the same sort frequently exists and finds relief in hemorrhage, when no ulceration can be found *post mortem*. The author thinks that, both in the case of the stomach and of the lung, a more or less sudden congestion may be the factor common to all these cases, and productive of the pain which finds relief by bleeding. By this congestion organs may become painful which, in the ordinary meaning of the term, are not sensitive. We see it in menstruation and in acute nephritis. Instances might be multiplied, but these give illustrations of what is a common pathological association. The statement has a very useful application in a practical point of view. The relief of pleuritic pains furnishes a not infrequent example.

Clinical cases from Dr. GEE's wards, the first of which is of *Locomotor Ataxy, associated with Perforating Ulcer of the Foot*. The patient had a chancre many years previous to the development of the ataxic symptoms, which had existed for three years; a year subsequently a hard corn over a metatarsal joint ulcerated, and later a second corn threatened to form a similar perforation. The special interest of the case arises from the apparent involvement in the same patient of the sensory strands of the spinal cord—the ordinary lesion productive of locomotor ataxy—and also the sensory and nutrient fibres, which, according to Savory and Butlin, are affected by disease or degeneration in perforating ulcer of the foot, thus giving a natural colour to the idea of a connection existing between the two diseases. Ball and Thibierge, at the Medical Congress of 1881, narrated twelve cases, “with the object of proving that the connection existing between the two diseases is a direct one.” Mr. F. Treves has recently communicated his opinion in the *Lancet* that the relation between the two is “casual and unimportant, and of little clinical value.” The other cases included in the paper are one of subacute anterior general spinal paralysis, and one of hereditary locomotor ataxy.

Mr. HENRY SMITH reports *A Case of Intracranial Aneurism* in a patient 16 years old, who had been in good health, and was free from any other visceral disease. The aneurism was the size of a pea, situated on a branch of the left middle cerebral artery, just within the fissure of Sylvius. It was ruptured, and there was a large effusion of blood under the pia mater, especially at the posterior part of the base of the brain. About a square inch of the left middle cerebral lobe was softened and broken up by clots of blood connected with the aneurism. The age of the patient forms a striking feature of the case, especially in connection with the absence of cardiac valvular disease. During life the patient was supposed, from the misleading history, to be suffering from chloroform poisoning with prolonged unconsciousness, artificial respiration was kept up for eighteen hours, without, during that time, a single respiratory effort being made by the unconscious patient. Howard's direct method was mostly employed.

The concluding paper is by Dr. DYCE DUCKWORTH, and is on *Diabetes in relation to Arthritism*. Arthritism, the author points out, is the arthritic diathesis, or peculiar disposition attaching to certain persons and families, whereby affections of the joints are liable to occur, and these especially of rheumatic or gouty nature. This paper is intended as a contribution to the subject of diabetes as connected with the arthritic diathesis, of which in English literature there is not much to be found. The German and French schools make varieties of this malady, and distinguish between the temporary glycosuria and an abiding diabetes. It is with the former class that the author proposes to deal—those cases which fall into the category of the milder and sometimes latent, or masked, forms of diabetes. “In such cases the relation to the arthritic state is sometimes very plain, sometimes less so. It is also the fact that such forms of diabetes exist, having no relation to arthritism, so far as can be discovered. From these there may be, and there have been, found other diathetic relationships. I mention these matters at the outset, lest it should be supposed that I seek to claim for all cases of mild diabetes a relation to the arthritic condition.”

The author does not feel prepared to furnish more than a sketch of the relation of arthritism to diabetes. Some connection between the gouty diathesis and diabetes has long been known, though few writers on these disorders allude to this relationship; but little light has been thrown on it, and it is one of extreme abstruseness.

Many short quotations from various authors, from the time of Prout (1843) to the present, show that this relationship has been observed for many years. Prout had classified diabetic patients into two groups, the spare and feeble, and the robust and corpulent type, and it was among the latter that he saw alternation between gout and diabetes. To such cases he applied the term latent diabetes. The late Dr. Bence Jones (1853) described intermittent diabetes, where the glucose alternated with an excess of urates. Dr. Gairdner (1854) wrote of saccharine impregnation, not amounting to any diabetic tendency, attendant on various phases of gout. Claude Bernard (1855) saw cases of alternating diabetes, in which attacks of gout or rheumatism replaced glycosuria, the urine being charged with uric acid. Laycock (1862) says that the gouty diabetic patient did not waste or become tuberculous. Marchal (1864) believed that gout and diabetes were only different expressions of the same morbid state—sub-diatheses of the uric acid diathesis. He regarded uric or gouty diabetes as the common variety and type of diabetes. “His theory was that when the uric acid diathesis affected the solids, it gave rise to gout or rheumatism, and when it affected the blood itself it set up diabetes, and that diabetes was nothing else than gout in the blood.” Lacorché, Trousseau, Charcot, Lancéreaux, Garrod, Gull, Roberts, Lauder Brunton, and Dickinson, all hold the belief, or have recorded the dependence of glycosuria upon a gouty or uric acid diathesis, or in some manner these two states alternating with each other.

Dr. Ord has recently analyzed twenty-two instances of glycosuria (no case merited the title of diabetes), and found the disorder, considered as a symptom of other troubles, associated with four conditions of importance: 1. Nervous disorder; 2, gout; 3, errors of diet; and, 4, albuminuria. Dr. Ord “declares for the nervous origin of the glycosuria, either as a central or a reflex disorder, and ingeniously offers an explanation for the intermittent form of the symptom in the gouty, comparing the disap-

pearance of the sugar to that which occurs in diabetes during intermittent inflammations, the glycosuria being, perhaps, 'a phenomenon of the same class as gouty inflammation of the joints, an active hyperæmia set going in part of the gouty process, set going in relation to irritation excited in the liver by dietary errors, or other causes, just as inflammation of a joint is set up by a wrench, or by over-exertion; that it may, in fact, be taken as meaning gout of the liver.'"

The weight of authority, then, seems to be that there is a diathetic glycosuria—perhaps more than one form—as distinguished from a substantive diabetes. However, it must not be forgotten that the temporary, perhaps diathetic forms of glycosuria, may become an essential or confirmed diabetes, if neglected. The distinguishing of the diathetic from the essential form of diabetes is not to be arrived at by the aid of the physiologist or the chemist, for the question is purely a clinical one. The older opinion was that gout and diabetes were in positive antagonism, and it has been observed that the symptoms of gout vanish as the diabetic symptoms supervene. Garrod explains this latter phenomenon by supposing that increased urinary discharge washes out the accumulated uric acid matters from the blood. Dr. Duckworth's own observations show the extreme infrequency of glycosuria in cases of well-marked gout; glycosuria comes in cases of irregular or incomplete gout. This rule does not hold for cases of rheumatic type, for in them the joint-affection appears to be present in a severe degree together with glycosuria. In rheumatoid arthritis the exacerbation of the symptoms does not exercise any beneficial effect upon the glycosuria. The number of cases of the rheumatic type with glycosuria is very small as compared with the gouty type. Charcot does not believe that diabetes has ever been observed as a complication of chronic rheumatism, and he points to Griesinger's statistics for confirmation of the statement. Garrod and Ord have, however, both observed cases.

"The most obvious fact to be noted in most of the cases now under consideration is that the patients do not present the ordinary aspect, or recognized symptoms of diabetes, as commonly understood." The recognition of these cases is oftentimes arrived at accidentally, since they present few or none of the prime symptoms of diabetes. The outlook for the patient depends upon the early cognizance of the malady, and our ability to deal successfully with the underlying diathetic condition. A gouty diabetes, which at first is generally intermittent, becomes, unless checked, pretty rapidly a confirmed state, which is just as hopeless, perhaps even more so, as the usual form of diabetes.

It is obvious that a strictly anti-diabetic diet, while efficient against the glycosuria, must tend to increase the gouty condition, and thus render the patient worse in the end.

The author presents a number of records of cases illustrating the diathetic relationships to saccharine urine.

M. L.

The first surgical paper is by W. J. WALSHAM, narrating *Some Cases of Deviation of the Nasal Septum*, five in number, which occurred in connection with the hospital practice in one year. Three of the cases had their origin in blows; in one it was congenital, and in one no cause could be assigned, although it had existed for ten years. The deformity, which varied in amount, interfered with proper respiration, and was remedied in three cases by forcible straightening, and in two forcible straightening

was combined with a subcutaneous stellar incision. In one case a slight perforation of the septum was a permanent result, but the treatment gave satisfaction. Only two other instances of this deformity have been observed at the hospital during the past ten years. It is therefore thought by Mr. Walsham that the record of these cases has a proper place in a volume which theoretically at least is a report of the year's work.

Mr. HOWARD MARSH celebrates his withdrawal from the Orthopædic Department by a paper of some length, being *Notes on Orthopædic Surgery*, in which the subjects of rickets, knock-knee, and lateral curvature are considered. A general description of rickets is given, and emphasis is laid upon the fact of its ready response to treatment by cod-liver oil, fresh air, and proper nourishment. The large experience of Mr. Marsh has convinced him that in early years there is every disposition for bent bones to straighten, and he thinks that osteotomy is rarely required. In knock-knee Mr. Marsh thinks that the tibia is more often at fault than is the opinion of Dr. MacEwen, who holds that the bowing inward of the lower part of the femur is the chief cause of the deformity. When knock-knee is once fairly established Mr. Marsh does not think that there is much hope of the limb straightening with the growth of the child. In the incipency of the deformity, rest, and keeping the child off its feet will accomplish much; but later the only remedy is a resort to some mechanical device, or osteotomy. This latter, as recommended and practised by Dr. MacEwen, Mr. Marsh has had considerable experience in, and has been satisfied with the results. The slight deformity introduced by division of the femur has, in Mr. Marsh's hands, been attended by no inconvenience. He draws attention to the fact that the operation does not affect the condition of the relaxed ligaments, and that some support is often required until they recover tone and are relatively shortened.

Flat-foot, Mr. Marsh thinks, has its origin most commonly in long-standing, superadded to rachitic changes in the bones and ligaments. He points out that its treatment to be successful must be early and preventive. Regulated exercise by the patient raising up on tip-toe is a most efficient means of improving the muscular tone, which with as much rest of the parts as is practicable and proper diet is the most hopeful treatment in the early stages. When the arch of the foot is lost, and there is rigidity of the tarsal joints, Mr. Marsh advises a forcible bending of the foot under an anæsthetic, and placing it in a plaster dressing to maintain the position. He also suggests a modified shoe with an elastic spring in its sole.

In the treatment of lateral curvature of the spine there is nothing new recommended. Mr. Marsh pretty vigorously attacks the plaster jacket of Dr. Sayre, preferring the poro-plastic one. We think he errs in supposing that Dr. Sayre advises the permanent encasing of the trunk in these cases. Such is not the case, as Dr. Sayre is very explicit in stating that it is only to be worn during the day. There is really no difference between these gentlemen in the opinion that in regulated exercise lies the best treatment for these cases, and that supports, whether of steel, felt, or plaster, are only adjuvants. The "vigour and enthusiasm" of Dr. Sayre appear to have stirred up some similar qualities in Mr. Marsh, who shouts "poro-plastic" as vigorously as the Bellevue professor cries "plaster." The paper is able, and valuable as the result of experience.

The next article is also one of great interest to surgeons, and one upon which its writer has expended much labour. It is entitled, *Imperforate Rectum and Anus in Infants*, by W. HARRISON CRIPPS. It consists of

a thorough, succinct, and discriminating study of the subject in continuation of the work done by Curling and Bodenhamer some years since. Mr. Cripps has collected one hundred cases which have occurred during the last twenty years, and has carried on a correspondence with many of their reporters, thus seeking to present the ultimate results, whether successful or otherwise. By this means he has sought, in the one class to ascertain the anatomical difficulties revealed by post-mortem examinations, and in another the amount and permanence of the success which has followed operative interference. Many surgeons are indisposed to undertake a search for the bowel in these cases from the difficulty sometimes encountered, and the large mortality attending the procedure. The mortality is, indeed, large, reaching 50 per cent.; but, on the other hand, the results are sometimes satisfactory in an eminent degree. Mr. Cripps records some of these results at considerable detail.

There is one very important deduction which can be drawn from Mr. Cripps's table, namely, that simple puncture, while in some instances attended by temporary relief, has a very high mortality, from the contents of the bowel escaping into the peritoneal cavity in very many cases. Then it is quite easy to miss the rectum by blindly thrusting for it with a trocar, when it could easily have been found by a careful dissection carried on up the face of the sacral curve. Verneuil has in two instances successfully removed the coccyx, thus obtaining more room for the dissection. When the search for the bowel is successful, Mr. Cripps is inclined to agree with Dr. Thorn, of Toledo, that it is inexpedient to attempt to draw its mucous membrane down. The tendency to contract, which almost always exists, is to be overcome by the use of conical bougies.

Should the bowel not be found *in situ*, the surgeon should at once open the colon either by Littré's or Amussat's operation.

This paper is one to which reference will frequently be made, and is not favourably placed, but rather hidden away in the pages of a serial with but a limited circulation. Good work would be done for the profession if some publisher were to issue collections of such elaborate statistical studies from time to time. Such a series would be both popular and valuable.

Remarks on the Scoliotic Pelvis is the title of a paper by FRANCIS HENRY CHAMPNEYS, M.B. It consists of a summary of Leopold's views, and a study of seven specimens contained in the museum of St. Bartholomew's Hospital. Tracings of the brims of these pelves are given, and the paper is an important contribution to the study of pelvimetry.

Mr. JOHN LANGTON contributes an exceedingly interesting paper on *Hernia of the Ovary*, which is instructive as well. It tends to show that the presence in the labia or inguinal canal of a body having all the characteristics of the ovary is by no means so rare as is sometimes supposed. Mr. Langton has met with them at all ages, but has failed to make out any malformation of the genital organs, further than a slight deflection of the uterus to that side, when only one ovary had descended. This is not in accord with the views of Englisch, who is of the opinion that malformations are frequently present with ovarian hernia. Altogether Mr. Langton has seen sixty-seven cases, but in only one has he had the opportunity of verifying his diagnosis by an autopsy, when the ovary with its Fallopian tube was found protruded. In twenty-five cases there was hernia of intestine present, and in forty-two the ovary was unaccompanied with enterocele. Out of 589 cases of congenital inguinal hernia

in female infants, observed by Mr. Langton at the London Truss Society during eight years, there were forty-three, in which these movable bodies or ovaries could be distinguished, and of these cases twenty-nine were reducible. Out of 3495 cases of inguinal hernia occurring after the first year of life in females, twenty-four were ovarian. Mr. Langton concludes that cases calling for surgical interference on account of malposition are, comparatively speaking, very rare. In only two has he seen such an amount of suffering as to lead to the suggestion of an operation, but in neither could the consent of the patients to such a procedure be obtained. This paper is well worthy of careful study.

Mr. W. J. WALSHAM essays to answer the question, *Is Trephining the Skull a Dangerous Operation per se?* by a comparison of the different estimation in which the operation has been held at different times, and an examination of some recent statistics. The unreasonable antipathy with which the measure was regarded twenty years since, and which still represents the mind of some first-class surgeons upon the subject, has been succeeded by a disposition to regard it as an almost trivial operation void of danger, and one to be most frequently resorted to. How strong was the feeling against the operation is shown by the fact that in France during ten years but four instances of trephining occurred, while so great has been the revolution in the minds of some observers that we hear of M. Sédillot recommending a resort to it in all fractures of the skull, and even as a means of diagnosis. Mr. Walsham's object is to ascertain how largely the mortality following the use of the trephine depends upon pre-existent conditions, and how much upon the operation itself. He has collected no less than 686 cases with 417 recoveries and 269 deaths, and has divided them into five classes: preventive, immediate curative, intermediate curative, delayed curative, and late trephining. It is evident that it is from this last class of cases, uncomplicated with acute inflammatory changes or extensive injuries, sufficient in themselves to lead to a fatal end, that we can best arrive at a correct estimate of the real dangers of trephining *per se*. There are 122 cases belonging to this class tabulated by Mr. Walsham, with a mortality of only 10.6 per cent., and he points out that in most of the fatal cases there was some special circumstance present which may account for the untoward result. Mr. Walsham has also tabulated and subjected to analysis twenty-two trephinations performed at St. Bartholomew's during the last twelve years, in which all of his subdivisions were represented, which were followed by ten recoveries and twelve deaths. He is particular to point out that in only two of the fatal cases belonging to this series could the trephine be regarded as the cause of death.

Mr. Walsham concludes that in suitable cases, and with the improved methods of treatment of the present day, we need not be deterred from resorting to trephining, as the risk from the operative procedure is slight. The paper and its appended tables constitute a valuable addition to surgical literature.

Three Cases of Removal by Operation of Cancer of the Rectum is the title of the next surgical article, by Mr. MORANT BAKER. It is a model paper for a volume of Hospital Reports, being a succinct account of cases occurring within the practice of the hospital. In one of the cases, the peritoneum was injured, and the patient speedily succumbed to inflammation of that membrane. In the second case, the operation required to be repeated, and, although not finally successful, pain was diminished, and life prolonged by a resort to it. In the third case, there

was entire and gratifying success, there being no return of the disease, with continued comfort and good health one year after the operation. Mr. Baker thinks that in every case of cancer of the rectum the question whether it can be relieved by operation should be carefully and at once considered.

Mr. WALTER S. A. GRIFFITH contributes *Notes of a Fatal Case of Perimetritis* occurring in a woman, aged fifty-two years, and which at first was regarded as cancer. The patient died, and a very good description of the specimen obtained, post mortem, is included in the paper. There was no evidence of injury, of cancer, or of fibroid growth.

Mr. ALFRED WILLETT has next a *Note on Manipulation as a Means of Treatment of Flat Foot, in the Acute Form*. The plan pursued is the same as that to which reference has been made in speaking of Mr. Marsh's paper. Mr. Willett, where there is much pain and stiffness, forcibly bends the foot, restoring the arch, and confines the foot in that position by a heavy plaster dressing and a peculiarly braced shoe.

Some Notes on Tracheotomy is the title of an article by W. E. STEAVENSON, M.B. The experience of the writer has been large with this operation, and he has grouped together in this article some of his observations. He gives a series of cases in which, as is by no means unusual, it was difficult to get the patient to do without the tube, and points out that it is only by persistency, gentleness, and tact, that the difficulty can be overcome, and that it is of the utmost importance that the attempt to remove the tube should be made as soon after the operation as possible. Mr. Stevenson prefers to have his cases watched by relays of students rather than by trained nurses, as the latter become discouraged after a series of unsuccessful cases, and are apt to relax effort. The fatigue attendant upon such cases is also great, and then it is of great importance that medical men should have a practical acquaintance with the details of nursing required. There are numerous hints contained in this paper, evidently born of experience, which will repay its perusal.

The medical antiquarian will be interested in an article by NORMAN MOORE, M.D., on *The Physicians and Surgeons of St. Bartholomew's Hospital before the Time of Harvey*. Much that is curious in the habits and modes of living in those days is revealed by the researches made by Dr. Moore, but there would seem to be no information possessed by our early predecessors which is of much value to the present generation. The paper is pleasantly written, and forms an agreeable literary oasis in the midst of purely scientific contributions.

It will be seen by the cursory account we have endeavoured to give of the surgical papers contained in this volume that they are of more than average value and importance.

S. A.

ART. XV.—*On the Pathology of Bronchitis, Catarrhal Pneumonia, Tubercle, and allied Lesions of the Human Lung*. By D. J. HAMILTON, M.B., F.R.C.S.E., F.R.S.E., Professor of Pathological Anatomy (Sir Erasmus Wilson, Chair), University of Aberdeen. With Illustrations. 8vo. pp. 248. London: Macmillan & Co., 1883.

THIS work had its origin in a series of papers which appeared in the *Practitioner* during the years 1879 and 1880. The author has since

carefully revised his observations and made the alterations necessary to bring the subject-matter up to the present day. The volume is inscribed to Erasmus Wilson, "as a tribute to his magnanimity in promoting pathological sciences." The tribute is worthy.

These papers, read with interest at the time of their appearance, constitute a valuable contribution to the subject of which they treat, in their present form. The very abundance of the material reaching the profession by way of the journals too often takes from that which is best in it the half of its worth. The hurry of perusal, the breaks in connected purpose through serial appearance, the disjointed thinking incident to the abrupt change of themes in the make-up of a well-edited journal are prodigal of work such as we have here. To read is to dimly remember; oftener at once to forget. It is fortunate that the most of the much read is far better promptly forgot. But something we would like to keep goes with those we gladly lose. Laying aside for future reading and careful indexing only help the worker in special fields, they are useless for the general journal reader. Next week's wave of work will sweep alike the interest felt in last week's journal and the time to read it into oblivion. Many of the best monographs are in fact reprints. In this there is a two-fold advantage. The author may make careful and deliberate revision; the reader finds, after a time, the articles he had intended to re-read ready bound and readable in complete and finished form.

The book is divided into two parts. Part I. treats of Bronchitis. There is no class of diseases more common than those characterized by catarrhal affections of mucous membranes, and there are no lesions of which the pathology has received less systematic study, and is, therefore, less accurately understood than the inflammatory lesions of these tissues. In catarrhal diseases of the bronchi, we have, perhaps, the most common and the most important of the affections of this class. The author's field of investigation is a familiar one, but the facts which are the objects of his study are little known. His method, which in the laboratory is not unmindful of the ward, and in the specimen does not wholly overlook the patient, is fortunate and not common enough among teachers of pathology, who, in devotion to one line of work, often forget that the ultimate aim of all the branches of medical science is the prevention of disease and the healing of the sick. His style is clear, fluent, and consequent. If his views are occasionally at variance with established doctrines, they are, for the most part, well reasoned out and definitely expressed.

The practical questions which he seeks in the present inquiry to answer, are: Where does the catarrhal secretion come from? Of what is it made up? Why does the catarrhal inflammation in some cases tend to pass off, and allow the mucous membrane to resume its normal function, while in others it assumes a chronic form, in which there is the greatest difficulty in bringing about a favourable result?

The structure of the normal bronchi and their surroundings is first described. The epithelium of the *mucosa* is composed of three layers, the superficial cells being columnar and ciliated, those underlying them transitional in shape, while deeper still is a flat layer resting upon a homogeneous basement membrane. The cells of the deepest layer resemble the endothelial cells of serous surfaces, and have been described by Debove as an endothelium underlying the epithelium proper in the trachea, bladder, and intestine. In the smallest bronchi these layers are no longer seen, the epithelium consisting of a single layer of somewhat cubical cells,

and in the air-vesicles the cells are flattened and extremely delicate in contour, resembling in all respects the endothelium of a serous surface. It would, therefore, appear that the structural type of the epithelium covering the whole of the air-passages, from the trachea downwards, is flat, and that the columnar cells in the bronchi are merely accessory to the underlying squamous layer.

The basement membrane which gives support to the epithelial covering and separates it from the underlying vessels and elastic fibres of the inner fibrous coat, is a perfectly homogeneous translucent substance. It is not acted upon by strong acetic acid. Carmine stains it of a pinkish colour; other re-agents, as silver nitrate, perosmic acid, etc., fail to develop any traces of fibrous or cellular structure in it. This membrane is always seen in man, but its structure and relations are best studied when, in catarrhal affections of the bronchi, in which it plays an important part, it has become œdematous.

The inner fibrous coat gives to the mucous membrane its fibrous character. Mainly composed of elastic fibres, it is abundantly supplied with branches from the bronchial artery, which form a rich plexus beneath and in contact with the basement membrane just described. This coat also contains plasma spaces, which are the radicles of the bronchial lymphatic system.

The muscularis lies next to the inner fibrous coat, and is to be regarded rather as part of the mucosa than as a separate investment.

The outer fibrous coat or *adventitia* is shown by the author to be of high importance in the investigation of the changes that take place in acute and chronic bronchitis. This structure embraces in part the framework of support to the lung. Composed of loosely disposed bundles of white fibrous tissue with intermingled elastic fibres, arranged concentrically to the bronchus and passing continuously into the adventitious coat of the larger branches of the pulmonary artery, it is continuous also with the coarse fibrous bands which separate one primary lobule from another (the lobular or interlobular septa), and which, followed outward, are found to pass to the deep layer of the pleura. Branched spaces of considerable size, the lymphatic spaces of the bronchial tissue, intervene between the bundles of fibres composing this tissue. These spaces, readily traced outward by means of the carbon particles, which form a natural injection in the lung of the coal-miner, are found to communicate with similar spaces in the fibrous tissues surrounding the pulmonary artery, while these again are continuous with larger lymph spaces in the lobular septa. The lymphatics of the lobular septa pour their contents into the rich ramifying plexus of the deep layer of the pleura, which communicates with the bronchial glands at the root of the lung. The superficial layer of the pleura never becomes pigmented, and probably has few or no communications with the deeper layer.

Lymphatic glands are continued along the bronchi to a considerable distance within the lung substance; they are represented opposite the bronchioles by peri-bronchial lymphoid deposits, situated in the adventitia.

The mucous glands are racemose, and open into the bronchus by a trumpet-shaped orifice. They are found in bronchi provided with cartilages, and lie partly in the spaces between and partly on the inner surface of the cartilages. Their deep epithelial layer appears to be continuous with the deepest layer of the epithelium of the trachea and bronchi (Debove's membrane), and resembles it in character. The superficial layer which lines

the duct of the gland and is lost in its alveoli, is, like the superficial layer of the bronchial epithelium, columnar and ciliated.

Having considered the anatomy of the bronchi, the author next investigates the mode of regeneration of their epithelial covering under normal conditions.

Unlike as are the cells of the three layers of epithelium, they are seen to be simply stages of development of the same cellular element, the deeper layers being the "raw material," from which the perfect columnar cell arises.

The function of the mucous glands seems to be in great part, if not entirely, the secretion of the fluid element of the mucus. In bronchitis this function is exalted to an extreme degree. Mucous corpuscles are doubtless also derived from the epithelium of mucous glands, but the chief source of these bodies is the germinal or primitive layer of the bronchial epithelium, of which they are the crude product thrown off in an unfinished condition. In the healthy subject, mere mechanical congestion lasting only a few hours is capable of giving rise to great œdema of the basement membrane and desquamation of the superficial layer of epithelium lining the larger bronchi. At the same time small round cells, apparently leucocytes, escaping by diapedesis through the distended walls of the bloodvessels accumulate in the fibrous coat of the mucosa.

These are the changes, also, which occur in the early stages of acute bronchitis. The columnar epithelium being shed, there is no attempt at its reproduction so long as the congestion continues. An excessive proliferation of embryonic epithelium (transitional forms) takes place. These cells, accumulated upon the surface and mingled with the secretion of the mucous glands, constitute the catarrhal secretion. At the same time the branches of the bronchial vessels are seen to be dilated, and the inner fibrous coat infiltrated with cellular structures, having their origin partly in the flat endothelial cells and connective tissue corpuscle of the inner fibrous coat, partly in leucocytes derived directly from the over-distended bloodvessels. These elements crowd outward toward the lung tissue, but never, according to the author, make their way to the free surface of the bronchi, being prevented by the basement membrane, which affords a constant boundary line between "what is epithelial and what belongs to the fibrous tissue of the mucosa."

The lymphatic glands at the root of the lung are invariably enlarged, the lymph-paths choked with "catarrhal-like" cells, the lymph-corpuscles increased to an inordinate degree, and the vessels deeply congested. Chronic bronchitis is considered under four separate headings, according as it is due to one or another of the four following causes: (a) an acute attack; (b) valvular disease of the heart; (c) inhalation of foreign matters; (d) chronic interstitial nephritis. The greater number of cases originate in an acute attack which has never undergone complete resolution. After a description of the gross and microscopic appearances, the author points out with force the part played by the basement membrane, which is constantly present, and "apparently indestructible." The presence of this membrane is a most important determining cause in the direction taken by the cell elements, which infiltrate to an enormous extent the fibrous layers and peri-bronchial tissues. Were it not for this elastic but impenetrable structure, they would wander towards the free surface of the bronchial mucosa, its epithelial being shed, and be thrown off from that surface as from a granulating wound, naturally taking this direction

as that of least resistance. On the contrary, they accumulate in the fibrillar interspaces of the inner fibrous coat, until, by pressure, they sufficiently distend these spaces to permit their passage outwards into the outer fibrous coat and lobular septa.

That form of chronic bronchitis caused by valvular disease of the heart is, in fact, a mechanical irritation due to regurgitant blood-pressure, not a true bronchitis. The secretion, which is poor in cellular structure, is, for the most part, composed of mucus from the mucous glands, and serum from the general mucous surface, and the excess of both is due to increased blood-supply and consequent œdema. The appearance known as *brown induration* is due to vesicular hemorrhages, capillary distension, and accumulations of degenerated alveolar endothelium.

A few pages are devoted to the consideration of chronic bronchitis due to the inhalation of foreign substances. Attention is directed to the fact that a form of bronchitis is extremely common in coal-miners in middle and old age. The expectoration in these cases is commonly yellow, mucopurulent, and not pigmentary, though the lungs may be found after death to be perfectly black. Upon microscopic examination of such lungs, the larger, middle-sized, and most of the smaller bronchi are *not pigmented*. "The catarrhal discharge which is found lying within them is of the usual yellow muco-purulent character, and neither to the naked eye nor microscopically is there to be found any evidence of the inhaled particles making their way through the mucous membrane of the bronchi." The explanation of this interesting fact is to be found in the resisting character of the basement membrane. The inhaled pigment particles find access to the lung parenchyma at the terminal structures of the bronchi, where this membrane is no longer to be made out. Penetrating the smallest bronchi, infundibula, and air-vesicles, they find their way into the peri-bronchial and peri-vascular lymph spaces. Thence they enter the lobular septa, still following the lymph channels, then the deep layer of the pleura, and they pass, finally, to the bronchial glands, thus making a complete natural injection of the lymphatic system of the lungs. The superficial layer of the pleura, which contains the lymphatics proper of the pleura, is not pigmented. The bronchitis is, in these cases, due to interference of the circulation by accumulations of pigment particles around the minute blood-vessels, the plugging of the lymph channels, and the resulting œdema of the interstitial fibrous tissue, especially that of the mucous membrane of the bronchi, by which the epithelium is kept in a state of constant irritation.

The microscopical appearances in bronchitis due to chronic interstitial nephritis differ from those found in the first described form, due to incomplete resolution of an acute attack, in no respect save that the muscular coat of the small arteries shows great hypertrophy.

The pulmonary affections which occur as complications and results of bronchitis are next studied. These are chronic interstitial pneumonia, vesicular emphysema, collapse of the lung, bronchiectasis, and occasionally catarrhal pneumonia. The last, in acute bronchitis, results from the inhalation of catarrhal products, whose cells denote their bronchial origin, into the vesicles during violent inspiratory effort.

Part II. treats of Catarrhal Pneumonia and Tubercle in the Human Lung.

Applying to this investigation the method employed in the study of bronchitis, the author seeks to trace out the "so-called catarrhal

changes which affect the alveolar walls, with special reference to their essential nature and mode of origin; and to show what the course, usual terminations, and complications of such pneumonic processes are." He draws, for the purpose of clearly setting forth his views, a brief contrast between this and "croupous pneumonia;" and, for the reason that the subject of "tubercle" is inextricably bound up with that of catarrhal pneumonia in its different stages, he aims to show what the mutual relations between it and catarrhal pneumonia are.

As a necessary preliminary to this study he considers the structure of the wall of the normal air-vesicle.

Its epithelium has the characters of endothelium. It is only to be seen after silver-staining. Its cells are large flat plates with sinuous bodies, usually having in their centre a nucleus, which is visible in staining with colouring reagents, such as hæmatoxylin. In many of the cells no nucleus can be seen. Besides these, other smaller cells, polygonal in outline, and granular in consistence, are seen. The author regards these as embryonic epithelial cells, which are constantly germinating, and points out the significant fact, in view of the greater predisposition of young individuals to catarrhal pneumonia, that these germinating groups are more numerous in the young than in the old. The alveolar wall is further made up of elastic tissue and small bundles of white fibrous tissue with occasional connective tissue corpuscles, an abundant plexus of capillary bloodvessels and a system of plasma spaces, which constitute, in fact, the radicles of the lymphatic system of the lung.

Although there is little evidence that the granular embryonic cells above described are of a connective tissue type, yet their pseudo-stomatous action in transferring foreign bodies from the alveolar cavity to an underlying lymphatic, as claimed by Klein and others, can be verified.

The structure of the alveolar wall and that of serous membranes, such as the pleura or peritoneum, are analogous. The essential point of difference relates to the origin of their endothelium. That of the peritoneum and of most serous structures is referred to the meso-blast; that of the pulmonary tissue (epithelium) is derived from the hypo-blast. To the distinctive character implanted upon these two structures in foetal life must be referred the difference of their action under pathological conditions. Under the influence of undue stimulation both are liable to germinate, and in both the appearances during the germinating stage are much the same, but while the result of this process in the peritoneum or pleura is usually fibrous tissue and adhesion, no such fibrous tissue ever results from inflammatory cell proliferation in the vesicular structure of the lung.

The author paves the way for the study of catarrhal pneumonia by a consideration of the effects of increased blood-pressure suddenly applied to the bloodvessels of the lung, as contrasted with the effects of long-continued excessive blood-pressure in the lung. Under the former condition a croupous exudation is thrown out; under the latter the capillaries become permanently distended, the epithelium desquamates, and a certain amount of serum exudes. The course of catarrhal pneumonia is divided into the three stages which correspond to three distinct phases in its clinical history: 1. The acute or subacute stage; 2. The stage of caseation; and 3. That of phthisis or destruction of the lung. The description of the pathological changes characteristic of each of these stages, and of their bearing upon the symptomatology of the disease, deserves the highest commen-

dation. It should be read by every practitioner. It is a graphic presentation of a subject that those who have not had the opportunity of laboratory work have seen, familiar as it is, only as a picture of blurred lines. Here it is sharp, clear-cut, and well worked out in every detail.

At the conclusion of the account of the second stage, the subject of tubercle in the human lung is introduced as necessary to render the account of the stage of softening intelligible. A tubercle, when full grown, is described as consisting of "a small, rounded tumour, made up of one or more giant cells, from which multiple fibrous processes radiate, and constitute a reticular fibrous tissue." The author "looks upon the greater number of the lymphoid and other small cells found within a tubercle as endothelial in their nature, and as in reality representing the connective-tissue corpuscles of the fibrous reticulum on which, or within which, they lie." He further states that we have "in the histological composition of tubercle a sure method of diagnosing those tumours which are tubercular, and of rejecting those which, although they may resemble tubercle in their gross characters, nevertheless prove to be totally different in their nature when more minutely examined."

The conclusions reached in regard to the significance of tubercle are :—

1st. That it is merely a form of connective tissue growth.

2d. That it is caused by an irritant acting upon the connective tissue, probably of the nature of a ferment, produced in the softening of a caseous mass.

3d. That this is carried embolically into different parts of the organ, and stimulates them locally.

4th. That the tubercle at first has a close resemblance to a sarcoma, but that, when the irritation has subsided, the connective-tissue elements organize, and give rise to fibrous tissue.

5th. That the ultimate destiny of the tubercle-nodule is to produce a small fibrous tumour.

6th. That the presence of the giant cells is merely an evidence of the return of the irritative connective-tissue elements to their embryonic type.

As to the etiology of tubercle, the author's theory is that of Buhl; as to its clinical relations his views closely follow the teachings of Niemeyer. Where the caseous focus of infection is in some distant point or organ, and tubercles are found without other lesions in the lung, they are designated as "primary tubercle of the lung;" when the caseous source of infection, and the tubercular nodules to which it gives rise are found together in the lung, the latter is designated "secondary tubercle of the lung."

The two main causes of such local infecting caseous centres in the lung are interstitial pneumonia or cirrhosis with bronchiectasis, and catarrhal pneumonia in the third stage. Both of these are accompanied by the development of secondary tubercles, but as they are more abundant and less obscured by complications in the former than in the latter, the author selects for special consideration the tubercular deposits of interstitial pneumonia. A minute study of the development of tubercle is followed by a discussion of the degeneration of the new growth. The commonest form is caseation. The close analogy between the caseation of tubercular deposits and of gummata is pointed out. Softening begins in the centre, absorption takes place, the cicatricial tissue surrounding the tumour contracts, and prevents the formation of a cavity.

The second form of degeneration is fibrous, not regarded in fact by the author as a degeneration at all, seeing that it is the ultimate stage of development in tubercular nodules.

The consideration of the third stage of catarrhal pneumonia completes the subject. There is, however, further described an unusual form of disseminated catarrhal pneumonia in which the lung is found after death to be diffusely studded with minute grayish nodules closely resembling tubercles, and often mistaken for them. These grayish masses are often yellowish in the centre, and altogether lack the histological structure of tubercle. They are in fact small isolated groups of air vesicles, filled with epithelial products, the group invariably caseating in the centre. The difference between this and ordinary catarrhal pneumonia in the second stage consists in the small size of the nodules, their isolated character, and their universal diffusion throughout the lung substance.

Finally, the concluding pages are devoted to "the supposed contagiousity of tuberculosis and pulmonary phthisis." The famous paper of Robert Koch in the *Berlinischer Klinische Wochenschrift*, No. 15, April 10, 1882, is reviewed at length. Even the allusion to "royalty itself" which caused a smile in one of our local societies, shortly afterwards, is reechoed from the shores of Scotland.

The conclusions as to the causative relations between the tubercle bacillus of Koch and pulmonary phthisis, which are, as we infer from current medical literature, being accepted widely by the profession, are according to the author not proven, and indeed illogical. Certain of Koch's conclusions are characterized as faulty, and extremely misleading, notably that which makes the presence of the tubercle bacillus a criterion of tubercle.

The following conclusions are set forth as all that the recognized facts will warrant:—

1. Catarrhal pneumonia is a disease resulting from various causes acting as irritants upon the air-vesicles and small bronchi. There is not the slightest evidence to show that the tubercle bacillus floating about in the atmosphere is one of these.

2. The catarrhal products are liable to caseate in certain subjects, particularly those of a strumous constitution.

3. When they caseate, there sometimes grows upon the caseous part a bacterium, which, if absorbed by the bloodvessels or lymphatics, is capable of irritating the tissues in which it becomes implanted, and forming a little fibrous hyperplasia. This body and no other is a tubercle.

4. Other caseous masses throughout the body, more especially those connected directly by means of lymph channels with a source of septic infection, act as the means of cultivation. They are, particularly, strumous glands or abscesses which have opened externally, bronchiectatic cavities, caseous bronchial and mesenteric glands, and the strumous testicle where a sinus has existed.

5. These facts and many others seem to warrant the conclusion that the tubercle bacterium is originally allied if not similar to that found in putrefactive wounds, but has become specially modified by being cultivated on a caseous basis, so that when absorbed, instead of causing a slough of the tissue by its virulence, it merely irritates the tissue into forming a little cicatricial tumour. Tuberculosis and pyæmia, as Sander-son long ago pointed out, have therefore the closest relationship.

6. The tubercle poison, like the pyæmic, differs from that of syphilis

and glanders in being generated *de novo* in a necrotic caseous tissue. That of syphilis and of glanders is propagated by contagion.

7. When once engendered the tubercle poison can be transmitted from host to host by inoculation.

8. The reason of certain caseous tissues throughout the body not propagating a tubercular eruption, is that by their position they are protected from extraneous contamination.

The question as to the heredity of phthisis is very ably discussed. Dr. Hamilton's views are, in fact, based upon, and are nearly identical with those of Virchow and Niemeyer. He sufficiently disproves the hereditary character of catarrhal pneumonia, and the affections which make up the group included under the term "phthisis," except in so far as they have their origin in a hereditarily transmissible delicate habit of body, accompanied by abnormal sensitiveness of the epithelium of the respiratory tract to outward impressions. He lays properly great stress upon the fact that catarrhal pneumonia is not a constitutional affection at first, and that it is only after caseation, and then perhaps only because the caseous masses become septic by the growth upon them of a special bacterium, that it becomes constitutional.

The inherent difficulties that beset the subject of the pathology of the wasting diseases of the lung are increased by the present modes of investigation. The worker in the laboratory, the histologist, or the mycologist properly so called, is too often without clinical training or experience of any kind, whilst the years of work at the bedside or in the consulting-room that bring close knowledge and wide views of the natural history of disease enforce at the best a second-hand acquaintance with the facts of normal and morbid histology. Specialism in medicine has done and is doing work that without it would be impossible. But specialism has been truly called "a morbid tendency of our times." We must await, for the solution of many urgent problems in pathology, the day when the work of the laboratory and that of the clinic, instead of occupying parallel, and therefore always sundered planes, are brought into harmony. This statement is especially true of the whole subject of phthisis and tuberculosis.

The text is made clear by sixty-five cuts, which, though drawn from specimens and with the amplification given, are sufficiently schematic.

J. C. W.

ART. XVI.—1. "*La Prima Ovariectomia in Italia, nel 1815.*" *The First Ovariectomy in Italy, in 1815.* 8vo. pp. 16. Carignola, 1882.

2. "*La Quarta Centuria d'Ovariectomie in Italia.*" *The Fourth Hundred of Italian Ovariectomies.* By Dr. DOMENICO PERUZZI, of Lugo, Italy. 8vo. pp. 10. From the *Raccoglitore Medico*, of Forlì. 1883, series iv. vol. xx. p. 173.

1. THE reliable modern history of Ovariectomy at least for cystoma is now generally admitted to date from December 1809, when Dr. Ephraim McDowell, of Danville, Kentucky, performed the world-renowned operation upon Mrs. Crawford, making a long incision in the side of the abdomen, evacuating the cyst by the knife before removing it, and saving the life of the patient. The date of his second operation is not upon record.

His third was performed in May or June, 1816, prior to which, it is claimed in the pamphlet under review, that a diseased (non-cystic) ovary was removed in Italy, and for the first time in Europe.

That the entire ovary was removed prior to 1809, in some of the operations in which the cyst was evacuated by incision and the wound kept open so as to form a fistula for drainage, is highly probable, as with the evacuation of the fluid, long membranous shreds were in exceptional cases drawn out, and a permanent cure resulted. The often-mentioned Laumonier operation, performed in the hospital of Rouen, France, on January 5, 1782, approaches in character a modern ovariectomy, but was in fact a combination of the older method by incision and drainage, and the new one by extirpation. The subject, Marie Louise Lagrange, was a prostitute of twenty-one years of age, who, after bearing a child, became affected by an abscess which opened into the vagina, and could be made to discharge more rapidly under pressure upon the abdomen, which appeared to contain a tumour. When opened by incision, to the extent of four inches along the lower edge of the external oblique, a scirrhus ovarian tumour the size of a hen's egg was found, together with an abscess communicating with the Fallopian tube; this latter when opened discharged a pint of pus. The ovary was torn from its attachments to the tube, and removed without ligation; the abscess cavity was stuffed with lint, and the external wound left open for drainage. Suppuration ceased on the twentieth day, and the woman was discharged well in forty-six days. This operation has been asserted not to have been an ovariectomy, but it is evident that an ovary or a morbid growth mistaken for it must have been removed, although the abscess cyst was not extirpated, as it would be under the present method of operating.

Was the Italian operation in question a true ovariectomy? Having access to the requisite authorities we are prepared to investigate the claim made in Italy, and very strongly advocated to the reviewer by Dr. Peruzzi, of Lugo. The report of the case was read before the Medico-Chirurgical Society of Bologna on November 10, 1843; the tumour removed was presented as an alcoholic preparation to the Society, where it is still preserved; and the account was published in the *Bulletino delle Scienze Mediche di Bologna*, series iii. vol. iv. page 332, 1843. The pamphlet under review contains this report; the remarks made by Mr. T. Spencer Wells (translated into Italian) upon the operation in question, published in the *British Med. Journ.* of March 16, 1876, page 363, and November 23, 1878, page 762, together with comments upon the whole in manuscript, by Dr. Domenico Peruzzi, of Lugo, who has long been interested in establishing the claim of the operator, and his own country, to precedence in ovariectomy in Europe. Having a warm personal friendship for the claimant, and a feeling of professional interest in Italy, the reviewer is disposed to grant every possible advantage in examining the subject, while at the same time being careful to be impartial in so doing.

The operator in the case was Prof. Gaetano Emiliani, of Faenza, and the recorder of it, his son, Dr. Emilio Emiliani, of the same city; and although not reported until twenty-eight years had elapsed, the patient and all the persons present at the operation were still living except the operator himself.

The subject of the operation was Rosalia Ghetti, of Faenza, aged 26 years, the wife of a baker, of lymphatic temperament, and the mother of three children, only one of which, an infant, was still living. Receiving

an injury in the abdomen from the edge of a pan of water, she was obliged to call in her physician, who detected a tumour, then quite painful to the touch, in the left inguinal region. Finding evidences of local peritonitis she was treated accordingly, but the tumour still remained. At the end of four months she thought herself pregnant, and two months later discharged a large mole, with a considerable loss of blood. As her disease advanced she became feverish, and numerous evidences of constitutional derangement appeared. At this stage Dr. Emiliani was called in consultation, and found the patient suffering with fever, remitting with attacks of chills, every night, affecting more especially the lower extremities and feet. She had a dry mouth; thirst; a coated tongue; constipation of the bowels; and morbid wakefulness. Dr. Emiliani confirmed the opinion of Dr. Brunetti as to the presence of a tumour, and this was decided to be an enlargement of the left ovary. It was hard, spheroidal, circumscribed, and not very sensitive; and was thought to be of a scirrhus character, and possibly a cancer, and they decided on its extirpation.

There were present at the operation Dr. Girolamo Brunetti, the physician of the family; Sig. Antonio Bucci, phlebotomist; and some friends of the patient, together with the operator. Dr. Emiliani made his incision about two and a half inches in length along the linea alba, and not in the side of the abdomen as was done in the first and second cases of Dr. McDowell. When the peritoneal cavity was opened the tumour was found, which from its position, form, and connections was decided to be an enlarged left ovary. This was hard, and had its superior portion studded with cysts, which when incised gave exit to a fetid ichor; this body was adherent by all its lower portion to the colon. The adhesions of the tumour were broken up, and its arterial connections tied by degrees and then severed. The amount of blood lost was estimated to have been about half a pound. The abdominal wound was closed by one suture, and dressed with linen spread with ointment, over which were placed a compress and bandage. By the third day, when the first dressing was replaced, the wound was found nearly cicatrized, and on the eleventh day the woman was virtually well.

Subsequent History.—In about a year after her recovery the patient gave birth to twins, a boy and girl, who only lived a few hours; then in time to another girl; afterward to a boy who died in infancy; then another boy, who perished in his youth from scrofula; in all five. The mother with two of her daughters was alive and well at the time the report was read, in 1843. At this time the tumour, which had been twenty-eight years in alcohol, was of a pyriform shape, and measured $3\frac{1}{2}$ inches in length by 2 in thickness.

Examination of the Specimen.—At the suggestion of Mr. T. Spencer Wells, of London, who was anxious to give due credit to Italy, the tumour was subjected to a careful microscopical examination, under Prof. L. Ranvier, of Paris, in September, 1878, the morbid growth having been brought for the purpose by Dr. Peruzzi, before mentioned. There were present at this investigation of the nature of the tumour, Dr. J. Marion Sims, of New York, Dr. Peruzzi, Prof. Ranvier, and Mr. Spencer Wells. Prof. Ranvier, after describing the method of preparing his sections, says: "In the sections made we discover only fibrous tissue and bloodvessels. The fibrous tissue is characterized by the connective fasciculi, interlaced in different directions, and by connective cells. The arteries are distinguishable by their muscular coat, which is well preserved. The veins

and capillaries are dilated and filled with blood; the red and white globules are still recognizable, which shows that the preservation of the tumour is relatively good. In none of the preparations that I have made are there either glandular channels, cysts, or Graafian follicles; still, it might be possible that the morbid tissue had originated in the ovary; but it would be necessary then to admit, which is not improbable, that it had effected a complete disappearance of the characteristic elements of this organ."

Was this Organ, then, an Ovary, or not?—This, in the judgment of the reviewer, can never be positively determined. Prof. Emiliani and his son evidently believed that the tumour was ovarian, from its anatomical relations; but there was nothing in proof of this elicited under the microscope. It is true that the specimen had been very long kept; but still not too long to distinguish arteries, veins, capillaries, white and red blood disks, muscular fibre, and fibrous and connective tissues. It is evident then that no ovarian stroma was found, for the sole reason that it did not exist in the tumour. The growth was fibrous only. If it is possible for an ovary to undergo such a vital change from disease, then this may have been originally ovarian in character. But such a total transformation is not in accordance with microscopical experience. We must either suppose that the ovary never had a proper elementary organization, or that the morbid growth grew from, but was not a part of, the ovary.

Ovariectomy as a surgical term has at the present time somewhat of a special meaning. When we speak of the operation having been performed upon a patient, without specially defining the character of the growth, the natural inference is that the patient was affected with a cystic degeneration of the organ. When the ovary has been but slightly changed in appearance by disease, or only moderately enlarged, its removal is known as a Battey's operation, or an *oöphorectomy*. A few well-known operators are now advocating the removal of diseased ovaries in their early stage of enlargement, and especially when affected with *cystoma*. This would constitute a somewhat intermediate operation, the fatality of which cannot be predicated upon the known results of the removal at an advanced stage. Prof. Emiliani removed a small pear-shaped, solid tumour, one end of which contained puriform matter, which he believed at the time to be an ovary. If it was not ovarian, the risk of the operation was the same; it was not any less difficult of performance; but there is a technical distinction to be considered when we come to settle the question of priority in ovariectomy among the countries of Europe. All credit is due the Italian surgeon for his boldness and success, but there must always be a doubt as to his having really extirpated an ovary in 1815.

The question of priority in Europe does not lie between Dr. Emiliani and Mr. John Lizars, of Edinburgh, as Dr. Peruzzi appears to have supposed. Mr. Lizars extirpated an ovary with success on February 27, 1825, but was antedated some years by Dr. Chrystmar, of Isny, in southwestern Germany. Dr. Hopfer, of Biberach, for a time Medical Superintendent of the upper district of Swabia, met Dr. Chrystmar in 1819, and was present at his third and fifth ovariectomies, the first of these on May 16, 1819, and the second (his fifth) in August, 1820.¹ In reporting his third, fourth, and fifth operations, *Dr. Hopfer writes that Dr. Chrystmar told him that, previous to his acquaintance with him in 1819, "he had*

¹ London Med. Gazette, Feb. 1829, from Graefe and Walther's Journ. vol. xii.

twice performed the operation of extirpating a diseased ovarium, and in one of these instances with success." This gives Chrysmar five cases instead of three, with which he is usually credited, and two of them saved. Dr. Chrysmar was a graduate of Vienna, had a private hospital, enjoyed a great reputation as an operator over a large extent of country, and died in 1821, aged 47. In the three cases reported, the tumours were solid, and weighed in order $7\frac{1}{2}$, 8, and $6\frac{1}{2}$ pounds. In the third of the five the tumour was adherent to the transverse and descending colon, greater curvature of the stomach, and parietal peritoneum. The eight-pound tumour was fibrous, and the patient was alive and well eight years after its removal. As Dr. Chrysmar did not report his operations, it is impossible now to say how early he may have removed a diseased ovary. There are reasons, however, for the belief of some writers that there were unreported ovariectomies prior to those now on record, and that it is impossible to say who in Europe was the earliest operator. Such is not the case, however, with regard to the United States, and credit is due in a special sense to Dr. Ephraim McDowell over any one that may possibly have antedated him in Europe, from the fact that he designed to remove an ovarian cyst, and undertook the operation for this avowed purpose, having made a correct diagnosis before resorting to the use of the knife.

2. In the January number of this Journal for 1881, we presented an account of the first and second hundred of Italian ovariectomies, and in the October number of 1882, the third hundred. We have now to review the record which contains the fourth hundred, and give a *résumé* of the results in the whole four hundred.

The fourth hundred, as we anticipated, covered a less period of time, and had a lower rate of mortality than the third. The first hundred commenced with March 26, 1859, and covered a period of 18 years and 3 months. The second hundred were performed in 2 years and 7 months, or a little less than one-seventh of the time: the third in one year and eleven months; and the fourth in eleven months.

The improvement in the results of the operations has been very marked and encouraging. Of the first hundred only 37 were saved. In the second hundred the percentage increased to 64; in the third to 74; and in the fourth to 79.

Dr. Domenico Peruzzi stands at the head of Italian ovariectomists in the number of his operations, his record being 31, counting one Battey case. The chief operators in the record of the four hundred rank as follows:—

	Operations.	Cured.	Died.
Dr. Peruzzi, Lugo	31	21	10
Prof. Marzolo, Padua	23	10	13
Prof. D'Antona, Naples	21	17	4
Prof. Ruggi, Bologna	14	8	6
Dr. Franzolini, Udine	12	8	4
Dr. Frattina, Pordenone	12	7	5
Dr. Borsini, Piacenza	10	8	2
Prof. Chiara, Florence	10	8	2
Prof. Cosentino, Palermo	10	9	1
Dr. Margary, Turin	9	6	3
Total Operators, 10	Total Women saved, 102		
Operations, 152	" lost, 50		
Percentage saved, $67\frac{2}{3}$.			

Of the fourth hundred, Peruzzi saved 3 out of 5, one of the former a Battey case. Prof. D'Antona saved 12 out of 13, or $92\frac{4}{13}$ per cent. Prof.

Inzani, of Parma, saved all his, 4; Prof. Chiara, 5 out of 7; Prof. Cosentino, 7 out of 8; Prof. Tibone, of Turin, and Porro, of Milan, each 3, all of their cases; and Drs. Frattina and Borsini, each 2 out of 3, *i. e.*, 41 out of 49, or over 83 per cent. collectively, by nine operators.

The following classified table shows the results of the ovariectomies, and some other forms of abdominal operations upon women, in the periods covered by the four reports respectively:—

	Total.	Cured.	Died.
1st report.			
1. Ovariectomies	100	37	63
2. Ovariectomies, partial or incomplete	7	0	7
3. Laparo-hysterectomies (supra-vaginal). Laparotomies with extirpation of peri-uterine tumours or other viscera	13	3	10
4. Exploratory Laparotomies	7	4	3
2d report.			
1. Ovariectomies	100	64	36
2. Ovariectomies, partial or incomplete	2	0	2
3. Supra-vaginal Laparo-hysterectomies	7	2	5
4. Exploratory Laparotomies	1	0	1
3d report.			
1. Ovariectomies	100	74	26
2. Ovariectomies, partial or incomplete	9	5	4
3. Supra-vaginal Laparo-hysterectomies	27	7	20
4. Exploratory Laparotomies	0	0	0
4th report.			
1. Ovariectomies	100 ¹	79 ¹	21
2. Ovariectomies, partial incomplete	7	4	3
3. Supra-vaginal Laparo-hysterectomies	19	9	10
4. Exploratory Laparotomies	6	5	1

The first and second reports have very complete tabular records arranged chronologically, and in nine columns, and it is much to be regretted that the others have not entered more into the particulars of the cases. In the 1st and 2d we have "*the operator, locality, date, age, social state, adhesions, treatment of pedicle, dressing, nature and weight of tumour, result, cause of death, and other notices.*" In the 2d and 3d all these are left out, but the name of the operator, locality and result and the cases are all presented in their totality for each operator. This has largely simplified the record, but has at the same time injured its value very materially as a means of instruction, in regard to the causes of success and failure in each individual case. The Italian record was of much value in showing the results of ovariectomy in general practice, and the diminishing mortality under new and improved methods of treatment, until the full table was dropped; since which we have only the improved results, with no minutiae on which to found them. It is to be hoped that Dr. Peruzzi's fifth hundred will be given in the tabular form of the first and second.

The most frequent causes of death in the last hundred ovariectomies were septicæmia, shock, acute peritonitis and hemorrhage. Double ovariectomies were performed in three cases: one by Dr. Truzzi, of Milan, case cured; one by Prof. Mangiagalli, of Sassari, Island of Sardinia, cured; and one by Dr. Frattina, of Pordenone, case lost. In one ovariectomy performed by Dr. Casati, of Forli, the case was complicated by pregnancy; still the patient recovered.

¹ 4 Battey operations, with 3 recoveries, are included in this record.

Bathey Operations in Italy.—Six of this type of ovarian extirpation have been reported, with four recoveries. Case 1. Operation by Dr. De Cristoforis, of Milan; woman died of hemorrhage from one of the pedicles. 2. Dr. Franzolini, of Udine, patient cured. 3. Dr. Peruzzi, of Lugo, August 10, 1882; disease hysterio-epilepsy; patient improved. 4. Dr. De Gaudenzi, of Vercelli, September 24, 1882; case, one of large *fibro-myoma uteri*, complicated with ascites; only one ovary found. Patient recovered, and tumour became atrophied. 5. Dr. Vecelli, of Venice, December 5, 1882, practised ovaro-salpingotomy of Tait, in a case of nymphomania, with entire success. 6. Dr. Giovannini, of Sant Arcangelo, December, 1882; case was one of uterine fibroma, with hemorrhage. Woman died in four days of septicæmia.

But for the fact that the Bathey operations of Italy have been quite as fatal as the ordinary ovariectomies, we should object decidedly to their being placed in the same table. As it is, we believe it more fair to keep them separate in calculating the mortality of ovariectomy. We do not see why "the partial or incomplete ovariectomies" should be excluded in the enumeration. These cases add 25 to the 400, and 16 of them fatal. It is correct to exclude exploratory incisions; but it is questionable whether we ought not to count all the incomplete operations, made such by extensive adhesions, or by errors in diagnosis. Excluding the four Bathey cases from the fourth hundred, and adding the 7 incomplete cases, we have 103 operations, with 80 recoveries, and 23 deaths, which gives a recovery of about $78\frac{9}{10}$ per cent., a marvellously good result, if all the cases of Italy are included in the record, when we consider that there were 49 operators in charge of the 103 patients, instead of one, or a few experienced surgeons.

R. P. H.

ART. XVII.—*Photo-Micrographs and how to make them, Illustrated by Forty-seven Photographs of Microscopic Objects, Photo-Micrographs, reproduced by the Heliotype Process.* By GEORGE M. STERNBERG, M.D., F.R.M.S., Major and Surgeon. United States Army, etc. 8vo. pp. 204. Boston: James R. Osgood & Co., 1883.

THE recent *renaissance* in amateur photography has created an especially opportune moment for the appearance of a full and reliable guide on the above fascinating subject, for who has microscope and camera without attempting to record on the sensitive plate the wonders of a hidden world? How far this want is met by the volume before us, is largely dependent upon the experience of the reader in this special line of work. To those anticipating a first trial in this direction, and entirely ignorant of the necessary details, the elementary instructions will be of great service; to those who have engaged in photo-micrography with any degree of success we doubt if the book in question offers much additional information, and but few novelties. We confess to a sense of disappointment on finishing the scant half of the volume devoted to the subject proper: the anticipations of valuable hints, from the extended experience of one so constantly engaged in photo-micrography as has been the author, have not been realized. With the unequalled work of the master-hand before us, it is indeed a task of difficulty to supplement and improve upon familiar methods,

where sunlight is employed. Dr. Sternberg has added little of value to the already well-known methods of Dr. Woodward.

Misconceptions regarding photo-micrographs are so widely spread that a few paragraphs found in the introduction are well worth presenting: the first two will answer a common inquiry.

“*Photo-micrographs* are sun-pictures of microscopic objects more or less magnified.

A *micro-photograph* is a microscopic picture of an object which can be seen by the naked eye. . . . Sun-pictures, as compared with hand-work, have the advantage of being quickly made, and of being absolutely true to nature. . . . By photography, the most delicate lines or shades are preserved, and one who has no skill in drawing is able to make a permanent record of what he sees in the course of his microscopical researches. That is, *within certain limits*, for not every microscopic object is suited for photography; and those who imagine that it will be a very simple matter to make photographs of all objects in their collection . . . are doomed to disappointment. Candor compels the admission that very many objects which seen under the microscope are very beautiful, cannot be successfully photographed. This is true of a majority of histological and pathological preparations not mounted especially for this purpose. It is true, as regards opaque objects, and objects of a deep-red, yellow, orange, or brown colour, as these are practically opaque for actinic rays. In short success in photo-micrography depends to a considerable extent upon the selection of suitable objects, and upon mounting these in the best manner for the purpose in view.”

Within the last half dozen sentences are expressed the gist of photo-micrography, a disregard for which causes so much of the disappointment incident to this work. For successful photographs, objects *must be suitable*, and for powers over one hundred diameters, all parts of the object must be within the same plane; this is especially true of animal tissues of which the sections must be of the greatest tenuity, embracing absolutely little more than a single layer of elements. But success—especially true of histological subjects—depends upon suitable staining as well as upon evenness, *differentiation* being a quality of the greatest importance; we believe the experience of many regarding carmine is quite different from the views expressed, since well differentiated carmine specimens are usually among those yielding the best results: in fact, *contrast* is practically more important than colour, deeply stained silver preparations frequently yielding excellent pictures by both sun and artificial light.

The author wisely suggests to the beginner, that a first attempt be made with low powers, and the simplest conditions of illumination, as with light reflected from blue sky directly through the object without the intervention of any condenser, the microscope and camera being, however, inclined eight or ten degrees from horizontal to obtain uninterrupted rays from the clear sky.

Just here the opportunity of adding really valuable new matter, such as would have been appreciated by the majority of those attempting this modification of photography at present, has been ignored by the author confining his instructions so closely to work by sunlight. Nine out of every ten who begin photo-micrography will prefer, results being equal, to devote the leisure of the evening rather than encroach upon the busy hours of the day. Had our author devoted enough time to the results obtainable by simple lamplight to develop its capabilities, and then fully recorded his experience in the present pages, he would have added matter of service to the majority of amateur workers. For the specialist whose almost daily needs require photography, especially with high amplifica-

tions, sunlight is undoubtedly to be preferred, but to the amateur, for whose instruction this book seems to have been especially written, lamp-light recommends itself by the simplicity and ease with which it may be employed—the results, with ordinary lenses and moderate amplification, being almost, if not fully, equal to those obtained by sunlight, as is testified to by a host of excellent negatives, and the experience of now many workers.

For the higher powers—five hundred diameters and upward—work by daylight without a heliostat is at best tedious and unsatisfactory, as is admitted by our author himself, where for an amplification of six hundred diam., with a Zeiss $\frac{1}{8}$ oil immersion, half an hour was required as an exposure with an instantaneous plate; with Zeiss $\frac{1}{2}$ oil immersion and amplifier, giving a magnification of over twelve hundred diam., on a plate by no means instantaneous, fifteen minutes sufficed to produce an excellent negative of Podura, with the illumination from a small flamed oil lamp—the rays passing through a bull's-eye and achromatic condensers. For convenience and best results in working by sunlight, for powers over three hundred diam., a heliostat is almost indispensable; to obtain the latter and the necessary accessory apparatus requires some considerable pecuniary outlay; to manage the light so obtained to the best advantage requires nicety of manipulation. It may be remarked, that in making the photographs illustrating the book, Dr. Sternberg has invariably employed the heliostat when the amplification desirable was over two hundred diameters. We reiterate, then, as the conclusions from an experience of considerable extent with both sunlight and heliostat, and lamplight, that for moderate powers, say up to two hundred and fifty diam., the capabilities of lamplight equal those of sunlight; that for higher powers, sunlight possesses decided advantages, but can only be utilized with satisfaction when a heliostat or a substitute is employed; that when direct sunlight is not employed for high powers, as good results may be obtained more readily with lamplight than with diffused sunlight.

The statement that required amplification should always be obtained with the lowest lens possible, removing the plate to a greater distance—even to eight or ten feet—rather than employ a higher objective, should, perhaps, be qualified by a regard for the character of both the object to be photographed, and of the lens used, since an objective under such conditions may fail entirely to show minute details of structure, which are clearly brought out by a lower amplification when a higher glass possessing greater powers of resolution is employed.

The arrangement for focusing described by the author, by means of cords passing over the adjustment wheels, with counterpoising weights attached, possesses decided advantages over the expensive and cumbersome appliance formerly used by many after the apparatus of the Army Medical Museum. This device for moving the fine adjustment was employed by the reviewer five years ago, and ever since has given perfect satisfaction; he can add his testimony to that of Dr. Sternberg regarding its perfectly delicate and accurate working: it seems, as frequently occurs, the same device for overcoming the difficulties and annoyance incident to the more complicated and expensive arrangement was contrived independently by two workers. The necessity of applying a cord to the coarse adjustment will not be felt by those who prefer to keep the focusing screen within four or five feet of the object, since, by having a mirror properly placed at the end of the board supporting the apparatus, the ground-glass of the

camera is clearly seen, a matter of great advantage when arranging illumination and hunting fields without uncoupling the camera and microscope, which is especially desirable when there is danger of disturbing the object. By a hand-mirror held near the ground-glass, approximate focusing may readily be accomplished while the operator is stationed at the microscope.

Our author having had experience chiefly with central light, photography by oblique illumination is not discussed. The advice to those purposing a trial in this more difficult field to procure Woodward's "oblique illuminator" may be supplemented by the recommendation rather to seek the aid of one of the recent wide-angled *immersion condensers*, which furnish light of the greatest obliquity, while possessing the great advantages of being readily manipulated and of furnishing central light at a moment's notice by simply turning a collar or milled head, an advantage which only those engaged in work over the severest tests will fully appreciate. The sections on "Black-Ground Illumination" and "Reflected Light" are interesting, the experiments being illustrated by photographs found in the latter part of the book.

While discussing the arrangements and fixtures where a darkened room constitutes the camera-box—a plan of work, by the way, which certainly, for the majority of workers, is less convenient than with the ordinary camera—Dr. Sternberg justly calls attention to the admirable views of microscopic objects, which may be had by receiving the image on a white screen. It may be added that, by the slight modification of such a "Solar Microscope," by placing a mirror in the path of the rays from the instrument they may be reflected to the drawing-board, when with the greatest ease and accuracy a faithful sketch may be made. In practice, the reviewer employs for such purpose a circular mirror of fine quality, the image of whose form readily announces distorted reflections on account of improper angle, as, when properly adjusted, the reflected field should be a true illuminated circle.

Within the next half dozen sections, the various manipulations incident to making the negative will be found, including the chemical processes of the dark-room, to which is added a section on making positives on glass for use in the lantern. While fully appreciating the impossibility of giving exact figures, yet the work of the beginner would be much facilitated by more extended and closer data regarding length of exposure; without being committal, it would have been desirable to state the average length of exposure, *under certain definite conditions of illumination*, for the lenses of the various usual focal lengths. The formula for the ferrous-oxalate developer would be improved by the usual addition of citric or oxalic acid to the oxalate solution, and sulphuric acid to that of the iron.

The last twenty-five pages of the book proper are devoted to "Selection and Preparation of Objects from Photography," under which heading are briefly considered a number of unicellular organisms, infusoria, spores, animal cells, including blood-corpuscles, vegetable tissues, diatoms, insects, and, lastly, animal histology and pathology, regarding which latter our author confesses to have given but little time, having devoted his attention "mostly to photographing unicellular organisms, and especially to the Bacteria."

The remaining pages of the book—almost a hundred—are placed at the disposal of the more or less extended and popular descriptions of the accompanying forty-seven heliotype reproductions of the photo-micrographs,

embracing a variety of objects, as well as illustrating the results obtained by the methods of work described in the previous text. The figures range in amplification from 12 to 1450 diameters; in objectives, from the 2 inch to the $\frac{1}{8}$; in quality, from excellent to execrably bad. In turning over these, one notes the quite disproportional excellence of a certain class of objects—bacteria and bloods; the explanation, however, the author himself supplies by stating that these have claimed his special attention. The photographs of blood and of *Navicula Lyra* are really fine, and deserve generous praise; the remaining plates are of varying degrees of excellence, among the better being, naturally, those of the diatomaceæ by central light, particularly the square of Möller's *Typen-Platte*, and *Triceratium Flavus*; plate IV. is decidedly the worst in the book—the photograph of Podura scale being little better than a caricature.

The wisdom of allotting so many pages to popular descriptions, which, from the premises, must be very incomplete, and but partially satisfactory, admits of question; however, the desire to interest and demonstrate to popular readers biological facts, influenced, no doubt, the author in his decision: the especial truth in view was "that the lowest living things are unicellular organisms, and that the tissues of the higher plants and animals are made up of cells."

While the generous distributions of space in margin and type are, probably, features desirable in the book as a candidate for popular favour, a closer economy of space would certainly render the volume more acceptable considered as a scientific contribution. In conclusion, we repeat, for beginners who propose to work by daylight, that the book will undoubtedly form a very valuable source of information and assistance; those already practically familiar with the instructions of Dr. Woodward will, probably, on the whole, find little to induce a change in their methods.

G. A. P.

Art. XVIII.—*Traité Clinique et Pratique des Maladies du Cœur et de la Crosse de l'Aorte*. Par MICHEL PETER, Professeur à la Faculté de Médecine de Paris, etc. Tome I. 8vo. pp. 844. Paris, Baillière et Fils, 1883.

ALREADY Michel Peter has become favourably known to American readers by a late edition, the sixth, of the admirable clinical lectures of Trousseau. Further, he has himself given us an insight into his peculiar ideas and special line of work by a treatise in two volumes of Medical Clinic, which even now has reached a third edition.

We are well prepared, therefore, to peruse with interest an exhaustive book from his pen, on the practical and bedside aspects of diseases of the heart, and of the arch of the aorta. While he professes in his preface to have borrowed explanations from anatomy and physiology, wherever he has been able to give greater precision and clearness to our knowledge of the diseases which he treats, he disclaims entirely those hazardous analogies from experiments on animals which are far from lending additional proof to the observation or interpretation of new facts. He directs the attention of his readers particularly to the consideration of those chapters in his work in which he claims to have elaborated fresh opinions, and trusts modestly

that the fruit of long meditation and research may prove to be of material advantage to those who follow him in a similar line of study.

After this introductory chapter, we have the first part of the volume, which is by far the longest as it should be (760 pages), devoted to diseases of the heart. The first forty-eight pages are divided into four chapters, which are taken up with some general anatomical and physiological views, with the anatomical and clinical aspects of the heart, the different methods of physical exploration, and the general notion of the pathogeny of the heart. In regard to the clinical examination of the heart, the author lays much stress upon pains, both spontaneous and provoked, which are deep-seated in the precordial region, which indicate surely an inflammation of the cardiac muscular structure, and which should not be considered, at least those produced by pressure in the fourth, fifth, and sixth left intercostal spaces, as at all evidence of ordinary intercostal neuralgia. We confess to the feeling that the author's clinical acumen has gone a step too far, and that he is developing with too great force a view which most observers will not find justified in their experience. It is true that there is frequently a sensation of vague pain in the interspaces of the precordial region when the heart structures are inflamed, either in acute or chronic disease, but usually these pains very closely resemble the myalgic pains of other muscles, which are unquestionably rheumatic in character and not seated in one of the underlying viscera.

Nor does the author stop with his interpretation of localized pains which are, according to him, in the cardiac fibre itself. He can distinguish by pressure in a certain point of the third intercostal space to the left, corresponding with the auriculo-ventricular sulcus, that the ganglion of Remak is morbidly deranged! Peter's clinical researches in this direction also take in the immediate effects of pressure over the cardiac plexus (disease of the aorta), the pneumogastric nerves, the phrenic nerves (angina). In acute myocarditis and pericarditis there is usually a local elevation of temperature of half a degree or more, which can be discovered by pressing the bulb of the thermometer over the third and fourth left intercostal spaces, one centimeter from the margin of the sternum (p. 43).

In a very graphic manner Peter directs attention to what he believes to be the false views of those writers who, hitherto in France, notably, have bestowed too great importance upon the mere existence of a lesion of valve, or orifice with its concomitant pathognomonic murmur. The study of the future, he writes, should be devoted more exclusively to the dynamic properties of the cardiac muscle and the nerves which control it. How often are these diseased, and yet how imperfectly studied and how little understood! We regret that in this place the author should not make mention of what others have done; for surely nothing in cardiac literature can be more delightful reading to the clinician than much that has been studied so carefully in this way by Da Costa and Allbutt, Flint and Fothergill, not to mention the learned articles from well-known German writers (Friedreich, Duchek, Wunderlich).

In section first, diseases of the pericardium are very thoroughly studied. In the article on the acute forms of pericarditis several good wood-cuts are inserted, and serve to illustrate the text. Although a large amount of the material which the author employs to give value to his affirmations is evidently drawn from his own cases, he does not hesitate to uphold his views by frequent citations from others. We are glad to note the value which is attached to the faithful work of the honoured Sibson, but are pained by

the general pervading tone of egotism which is betrayed whenever claim is made to precedence of observation. The analysis of some of the symptoms of acute pericarditis is very carefully made, and here in particular considerable importance is attached to local thermometry as an excellent diagnostic means (p. 115). Under the head of treatment of chronic pericarditis, full discussion is given to the question of the advisability of puncture in the event of the effusion giving rise by reason of its quantity to alarming symptoms, which other methods of treatment are inadequate to relieve. Many precautions should be taken in the operative procedure, and every care must be observed so as to avoid an error of diagnosis. Even when the operation has been successfully performed the consequences have not usually been so satisfactory as would at first appear. The simple puncture of the heart cavities with a capillary needle will not occasion fatal or even distressing symptoms. A case reported by Roger does not prove that cardiac thrombosis is thus produced. With respect to this interesting topic, we regret not to find the name of Dr. Roberts, of Philadelphia, even mentioned.

The author has no personal experience to record.

The second section comprises the different forms of myocarditis, fatty degeneration and infiltration of the heart, spontaneous heart rupture, cardiac hypertrophy, dilatation, and atrophy. No disease is more infrequent than generalized myocarditis. Localized myocarditis is not rarely encountered as an extension of inflammatory disease of the endocardium or pericardium. When it does occur, it is rather an affection with which we become familiar in the pathological amphitheatre than in the hospital ward. It is usually dominated by some well-known blood dyscrasia, usually that of rheumatism. It terminates not by suppuration or resolution, but rather by degeneration or "stifling" of muscular fibre. In the treatment of chronic myocarditis, even where there is granulo-fatty degeneration of tissue, the author is not without hope in its efficacy. He applies small repeated fly-blisters in the precordial region, and says their application is constantly followed by an amelioration of morbid sensations, and also by a better functional condition of the heart itself, as shown by diminished palpitations. The same amelioration may be obtained by punctuated cauterization either with the actual or the thermo-cautery (p. 237). He regards nux vomica as the *special stimulant* of the cardiac muscle. By the use of small doses of the powder or tincture he has obtained good results where digitalis had been evidently powerless. *A propos* of hypertrophy of the left ventricle the author adopts clearly the views of Gull and Sutton in regard to the causative influence of a condition of generalized arterio-capillary fibrosis. The treatment advocated by the author is not one directed to the heart itself, but to the arterial lesion, which is the efficient factor of the cardiac enlargement. He prescribes from 8 to 25 grains of iodide of potassium each day during two weeks, and alternates its use with tannin (8 to 15 grains per day) to be taken during a like period. Caffeine at the dose of 4 to 5 grains a day is useful in increasing diuresis and augmenting the contractile force of the left ventricle. The double result obtained by caffeine appears to be less work for the heart to do and greater vigour for its accomplishment.

The three hundred pages which are contained in the third section make almost a respectable volume by itself. In it we have the different inflammatory conditions of the endocardium described at length, all that pertains to an advanced knowledge of the chronic valvular affections,

together with an admirable article assigned to various special medications of heart disease. The influence of pregnancy upon the heart is also completely studied, and the diseases of the right heart terminate this important portion of the work. Peter regards acute endocarditis with formation of vegetations as only a less advanced form of ulcerous endocarditis. Amongst the complications which are most striking, and which are specially studied, are visceral infarctus. In the treatment of this form of disease he eschews in every form the use of digitalis, but commends the hypodermic use of ether and quinine and caffeine by the mouth. The work of Maurice Raynaud, who died shortly after the session of the International Congress in London, in 1881, is often referred to with great favour in the course of this article. The secondary consequences of chronic valvular affections, particularly in producing hyperæmic conditions of the viscera, are held to be of great importance. Two very excellent wood-cuts accompany the description of mitral stenosis (pp. 482 and 483). The presystolic murmur is present only on condition that the *right auricle is already and sufficiently hypertrophied*, so that there are instances in which it is not heard. Mitral stenosis may produce, but very infrequently, a diastolic blowing murmur. When found it is heard somewhat to the left and below the left nipple.

SpHYgmographic tracings, borrowed from Marey and Lorain to illustrate this cardiac lesion, demonstrate that extrinsic circumstances, such as respiratory anguish or violent exercise, occasion irregularity of the radial pulse.

Sudden death in aortic regurgitant disease is mainly due to *neurosis of the cardiac plexus by material lesion*, and not, as is so often stated, provoked by the reflux of the blood from the aorta into the ventricle and the consequent bulbar ischæmia and circulatory oppression. No mention is made of Balthazar Foster's diagnostic signs of differentiation according as one or other cusp at the aortic orifice is wholly insufficient. Arseniate of soda alternated with iodide of potash, and a dose of one-twelfth grain daily, is advised. Here, again, as in the local treatment of cardiac diseases generally, the author relies upon Vienna paste, or punctuated cauterization with the hot iron.

The general treatment of valvular lesions is an admirable chapter on therapeutics of cardiac diseases of chronic nature. Our author is not loth to withdraw blood from the economy either by venesection, or by wet cups or leeches. In this manner he lessens considerably those congestive conditions of the lungs, brain, or kidneys which are time and again of such bad augury. Would that our therapeutists on this side of the Atlantic might read and reflect upon the wise counsels given in regard to this so-called "lost art" of bleeding! A pill of calomel, digitalis, and squill, ãã gr. j, is often useful, and an expectorant mixture, in which kermes mineral and acetate of ammonia are combined, is one the utility of which we have already tried. The nausea and vomiting at times occasioned by granules of extract of digitalis, or digitaline, are effectively combated by one or two drops of laudanum in a teaspoonful of water.

Quite beyond the sphere of drugs called "cardiac"—at the head of which is digitalis—there are *general means*, and over everything, "*the decongestioning medication*:" sometimes that which frees directly one or other engorged viscus (lungs, liver, or kidneys), and that by local bleeding or fly-blisters; sometimes that which acts upon the entire mass of blood and at once by *venesection*.

In regard to the comparative indications of digitalis and caffeine in organic diseases of the heart, the author writes: "Digitalis is especially indicated in cases of excessive frequency of cardiac beats, with tumult and irregularity; caffeine, particularly in cases of cardiac weakness, with slowness of the contractions." The fourth section embraces the neuroses of the heart, in which are comprised palpitations, angina, and exophthalmic goitre. The work concludes with the study of inflammatory affections of the aortic arch, and aneurism of this portion of the main arterial trunk.

Three fine chromo-lithographic plates representing myocarditis, chronic aortic disease, and embolism of the left median cerebral artery are appended to the printed text, and are a suitable crowning addition to this volume of thorough clinical work.

To sum up our general impression of the work, we would say it is really admirable throughout. It shows, in its philosophical grasp of a great subject, a broad intelligence. The symptoms and diagnostic differences are everywhere given with ample details. Many of the physiological explanations as applied to cardiac pathology are novel and striking. As to the therapeutic indications, whilst we cannot always agree, we invariably have read with interest the statements made by the writer. Many of his suggestions we accept with suspended judgment, simply because we have not tried them. It would be well if this work were translated for American readers, for, except Flint's treatise, which is fast becoming old, we have nothing to compare to it.

B. R.

ART. XIX.—*Practical Histology and Pathology*. By HENEAGE GIBBES, M.D., Lecturer on Physiology and Histology in the Medical School of Westminster Hospital; Late Curator of the Anatomical Museum, King's College. Second edition. 12mo. pp. 154. Philadelphia: P. Blakiston, Son and Co., 1882.

WITHIN the two years which have sufficed to call forth a second edition of this little book, it has certainly gained for itself an enviable esteem as a reliable and excellent synopsis of practical methods; the present revision will go far to strengthen its favourable reputation. The book has been somewhat enlarged by an increment consisting of two chapters to the pathological section regarding the now universally studied Bacteria, as well as by additions and alterations in the original matter.

The paragraphs devoted to microscopes and lenses, naturally, contain changes and additions to bring the text to date, as within the last two years much has been done in the now almost universally manufactured oil immersion lenses, to the admirable qualities of which Dr. Gibbes adds his tribute. The advice to the casual worker, however, to purchase an oil immersion without correcting adjustment on the ground of the practice incident to training the eye to know when the lens is properly adjusted, we hardly endorse. That these lenses should have correcting adjustment to render their performance equally good under varying conditions of preparation and immersion fluid, is now conceded by nearly all first-class makers. Oil immersions are so sensitive to the correcting collar that the eye soon learns to recognize the point of best definition, and it must, indeed, be a casual worker to whom the acquiring of this eye-

training is not worth all the time it costs. Practical men, as a class, are lamentably deficient in obtaining the best results with their instruments; surely those to whom lenses are a means of investigation should be able to handle and manipulate their tools to the very best possible advantage, and especially should they be able to tell whether their lenses were fairly corrected for present conditions. That a correction on an oil glass *is* of practical value where the highest definition is required is undoubted, as the seeing of delicate detail, as intra-cellular networks or striæ, is sometimes the matter of a turn of the collar; moreover, with a non-correcting lens the best effect is by no means always at once obtained, since frequently for their best performance correction by varying the length of the tube of the stand is necessitated; if, however, such care be deemed superfluous, then with equal facility can the collar of the adjustable lens be always placed at the same point, with the advantage that useful education of the eye may be had without a change of lens. It would have been well to state that the great nuisance of cedar oil and damaged mounts can be disposed of by the substitution of other immersion media, among the best of which is Van Heurck's (balsam copaiba and vaseline or oil of cedar)—which are now generally adopted by American makers, whose oil immersions are second to none; these immersion-fluids wash off readily with water, and do not affect ordinary mounts.

It is gratifying to note that the importance of proper illumination is still more emphasized, and neutralizing blue glass for artificial light and the achromatic condenser recommended. Even a limited observation will convince any one that of the many using the microscope with artificial light, it is but the exception to see proper illumination receiving attention; without blue glass the appearance of many stainings is entirely marred; without careful graduation and proper adjusting of the intensity of light the definition of the best lens is impaired.

We also find a passing word in favour of large stands, with all the refinements for delicate work. In this the author is quite in accord with the experience of many—for the work-table a small stand (the simpler the better) is indispensable; when, however, a careful examination or exact observation is on hand, in which every gain in definition is of importance, the large elaborate stands, when properly handled, show preparations in a manner never approached by the small laboratory stand, this being especially so regarding the continental or "Hartnack" model. To the many attached to the latter stands, this may seem exaggeration, but careful comparison will, we believe, confirm the assertion.

The chapter on Staining has been remodelled by many additions and some omissions, the list containing the more recent dyes, including many anilines. We regret that the author should have seen fit to drop from his list carmine. While true that for research hæmatoxylin has largely taken its place, yet carmine is also useful when carefully applied, giving admirable differentiation, which for ordinary sections is equal to that of hæmatoxylin, and withal possessing a certainty of permanence as well as greater transparency of colour, to which the latter cannot claim. If not favoured, it certainly deserved its former place in the list of stains, in which Bismarck brown could with propriety have been included, as for some purposes—as photography—it is especially valuable. The sections on double and triple staining possess their former interest. In the paragraph regarding choice of cover-glasses we mark a change in opinion; formerly with the scorn of the "practical men" round covers, with the

turntable, were consigned to "where æsthetic mounting is the order of the day." The advantages of square covers resulting in clumsy and insecurely cemented slides, when the greater ease, security, and rapidity offered by a turntable and round covers were at hand, we confess never to have appreciated; however, the necessities of oil immersions, and perhaps glycerine mounts, have modified our author's opinion, and we now find "for ordinary work square covers will do," but ones appropriate for use with the turntable are recommended when the slides are to be securely sealed. A chapter on injecting has been added to the space allotted to technology.

The section devoted to "Practical Histology" has been rendered more complete by the insertion of descriptions of a number of the varieties of the connective-tissue group, including endothelium, which were before wanting.

It is, however, the pathological section which has received the largest share of new matter, the pages from barely five being increased to forty. Useful hints are added as to sealing up jars with preparations for the museum, as well as the directions of Mr. Prestley Smith regarding the "Mode of preserving ophthalmic specimens," which will be of value to those interested. The final two chapters of the book are devoted to Bacteria; one to the methods of culture employed by Klein for the *B. anthracis* and of Koch for the *B. tuberculosis*, the other to the methods of staining these organisms. The principal staining methods for the *B. tuberculosis* are given, including those of Koch, Ehrlich, Weigert, Baumgarten, and our author. Of especial interest, in this connection, is the method of Dr. Gibbes to double stain sputum at once, possessing the advantages of rapidity and of dispensing with the use of nitric acid. Rosaniline hydrochloride, methyl blue, aniline oil, rectified spirit, and distilled water compose the formula. "It brings out the bacilli quite as well as the other processes, and it stains all putrefaction bacteria and micrococci very deeply, so that in one field of the microscope blue micrococci and bacteria may be compared with the red bacilli of tubercle"—a statement quite in contrast with the assertions of those who deny the specific staining of the *B. tuberculosis*.

On turning the last page of this little book, one feels that a really valuable guide lies before him; one exactly adapted to the needs of those to whom laboratory instruction has never been available. Our author shows in his methods a care and respect for exactness to be warmly recommended—a happy compromise between the fruitless nicety of the microscopical dilettante and the wilful negligence of the practical worker.

G. A. P.

ART. XX.—*Index-Catalogue of the Library of the Surgeon-General's Office, United States Army. Authors and Subjects.* Vol. IV. E—Fizes. 4to. pp. [12] 1033. Government Printing Office, Washington, 1883.

THE appearance of each new volume of this most important work is a subject of congratulation, not only to those who have been concerned with its preparation, but to every really scientific physician.

When the predecessors of this volume were issued, we spoke of the magnitude and scope of the work. It is therefore unnecessary again to express our sentiments thereon. The present issue contains 4802 authorities, representing 1926 volumes and 3885 pamphlets. 12361 subject-

titles of separate books and pamphlets, and 48,977 titles of articles in periodicals are also included within its covers.

Turning at random to one subject, with a view of forming some estimate of the thoroughness with which the work has been done, we find that "Excision" has no less than twenty-four pages devoted to it, while the titles of works upon the eye extend from page 450 to page 549.

There is but one matter to regret in connection with the publication of this invaluable work, and that is, the limited editions with which, owing to the unwise parsimony of Congress, the Surgeon-General's Office is obliged to content itself. It is to be hoped that this state of things will not be allowed to continue, but that the individual members of the profession will exercise such an influence upon their representatives in Congress, as will induce them to vote for a much more liberal appropriation at the present session. It is a subject into which no partisan feelings should enter, and to forward which there should be exerted a unanimous effort on the part of the medical profession, and of scientific men in general.

The projector of this vast work has given to it an amount of honest labour, scientific attainment, and practical skill which entitle him to the highest praise, and which should secure to him all the support for the furtherance of his plan which the medical profession can bestow or secure.

S. A.

ART. XXI.—*Practical Clinical Lessons on Syphilis and the Genito-Urinary Diseases*. By FESSENDEN N. OTIS, M.D., etc. 8vo., pp. 584. New York: Bermingham & Co., 1883.

THE first thing to be remarked about this book is that it is in no sense what the title on its back—"Genito-Urinary Diseases and Syphilis"—would lead one to expect. It is not a treatise on the diseases of the genito-urinary system, but simply two volumes, elsewhere printed separately, one of them treating of syphilis and the chancroid, and the other of gonorrhœa and its sequelæ. This fact is rather forced on the reader's attention by the other fact that the middle of the book contains four pages of "contents," between pages 260 and 261, and that a duplicate of this, paged 15-18, stands at the beginning between pages 14 and 17! If anything else were needed to emphasize this point, it would be supplied by a circular, recently issued by the publisher, announcing two volumes for sale with the two titles we have given. This present union may be an advantage, or may not; it certainly will be none if it leads the buyer to suppose he is getting what the author in his preface distinctly disclaims his work to be; for he says, "No attempt has been made to make it a systematic general exposition of genito-urinary diseases."

If we take the book for what it is, we find in it much that is interesting and much that is instructive. One need not be an entire convert to all the author's opinions to get profit from them. His views of the nature of syphilis and syphilitic infection, for example, are interesting, and deserve careful consideration, though one may rise from their study with a conviction that they are more ingenious than conclusive. These views have been before the world for more than ten years, and they have not yet, as far as we are aware, been accepted by a single syphilographer of repute. The claim of the author that they have been "practically" adopted by

several authors, whom he names, seems to be founded upon his taking their words for a little more than they meant. Thus, the fourth edition of Bumstead and Taylor's book is cited as supporting them; but this support does not appear in the language Dr. Otis quotes, and it is specifically and somewhat indignantly disclaimed in their fifth edition, where, after denying him the merit of originality in the views he holds, the writer says: "Dr. Otis asks us to assume certain fancies in the absence of definite facts, and to felicitate ourselves with the idea that we know how syphilis works in the system, when the truth is that we do not." The theory of Dr. Otis is, that the syphilitic contagium is not a virus, in the ordinary acceptation of the term, but consists of degraded germinal cells, which, invading the healthy tissues, multiply and affect the healthy cells of the recipient with their own vicious nature or habit, so inducing the entire disease. This theory, as we have stated, has a great deal of ingenuity, but it is as yet entirely unproved.

In speaking of the chancre, Dr. Otis plants himself firmly on the theory that it is simply a venereal ulcer. In this he shares the opinion of the majority of modern authors. It is a satisfaction to one who is convinced of the correctness of this theory to find him calling the chancre the "venereal ulcer." In connection with the history of the chancre, he speaks of its undeniable antiquity, as compared with the comparatively recent appearance of syphilis. In doing so he rather weakens the force of his previously expressed belief that the latter disease was known to Moses, and his acceptance of the rather questionable authority of Captain Dabry that it flourished in China over two thousand years before the Christian era. The sort of evidence upon which the opinions of the great antiquity of syphilis rest is so aptly illustrated by Tartenson (*La Syphilis*, Paris, 1880) that we cannot refrain from referring to it a little more fully here. Tartenson, like Dr. Otis, accepts the authority of Captain "Gardy" (whom Otis, as well as Bumstead and Taylor, calls "Dabry"), and specifies the lesions he found described in the ancient Chinese writings, which can hardly be doubted to have been syphilitic. He, however, says the most ancient of the writings which he translated were of the seventeenth century B. C.—three hundred years less than Otis says. Then he goes on to speak of its antiquity in India. For proof of this he relies on a work on medicine, which he says is called the *Sucrutas*, and was written in the fifth century B. C. But certain German scholars have maintained that this is not the name of a work, but of an author, called variously, and that the various names under which it appears are only corruptions of "Socrates," to whom many comparatively modern productions have been, in India, attributed. He also cites a myth about Vishnu, as follows:—

"Siva, seduced by the beauty of the wives of the worshippers, took the form of a young mendicant of perfect beauty and went to the gathering place of the penitents, accompanied by Vishnu, disguised as a girl. The latter cast such tender glances at all the men that they became enamoured of him, and left their sacrifices to follow him. During this time Siva went toward the house of the women, who, hearing him sing, were charmed and came running around him. Their agitation was so great that they dropped their jewels and their garments without perceiving it, and followed him in the costume of nature. They all accompanied him thus into a neighbouring grove, where he obtained from them what he desired. When the worshippers discovered their dishonour, and the stratagem of which they were the victims, they resolved to be avenged of Siva, and demanded of the gods the punishment of the guilty one. Thereupon a fire fell upon the genitals of Siva, and separated them from his body. Enraged at being visited so cruelly, Siva resolved to transmit this frightful malady to the

whole world. The victims were already numerous when Vishnu and Brahma, who are charged with the preservation of the creatures, arrested the evil. Siva, however, would not be moved by their prayers, except upon condition that mankind should render divine honours to his genitalia."

This is a myth; so is a great deal of the evidence upon which the antiquity of syphilis rests.

The third principal division of this book treats of gonorrhœa and its sequelæ. The author holds, with most modern authorities, that gonorrhœa is a non-specific disease. In support of this view he cites a number of interesting proofs, which are still needed, since there are those who yet believe there is a specific virus for this affection. He says that gonorrhœa is "without ulceration." It is true that ulceration is very rare, but it would appear from the endoscopic investigations of Grünfeld (see *Med. Jahrb.*, Bd. iv., 1877) that he at least believes in its occurrence; and there is certainly a condition, first studied by Désormeaux, and well described by Grünfeld, analogous to granular conjunctivitis, which comes pretty close to that of ulceration.

Of course this book contains a full statement of the author's well-known views in regard to the normal calibre of the urethra, and the proper treatment of stricture. These views have met with decided approval on this side of the Atlantic, but have not been so well accepted across the water. One who is so old-fashioned as to doubt what to others seems so plain may see in many an American surgeon's armamentarium those enormous bougies which look like truncated walking-sticks, and which give a sort of horror to one who has not used them. But it seems only fair to admit that they must be the best judges of their safety and utility who have tried them, unawed by any preconceived notions of the smallness of the urethral canal; and these are practically unanimous in their favour. Dr. Otis gives us not only his own report of successes by dilating and cutting strictures, but also a strong array of the experience of other surgeons who have adopted his method. The most important of these show the condition of patients after intervals of five or six years, and there are hundreds of apparent successes that have not been so long a time under observation.

Dr. Otis is a believer in the frequency with which preputial irritation is a cause of reflex nervous disturbances, citing, among others, a curious case from Dr. Brown-Séquard, where all the symptoms of *ramollissement* of the brain were removed by curing a phimosis accompanied with balanitis. Contraction of the meatus urinarius he likewise regards as a cause of various reflex disorders, and gives a number of cases to support this view.

In the last "Lesson" the author discusses exploration of the bladder by means of a perineal incision. He claims that this operation was appreciated in America at least ten years before it was proposed by Sir Henry Thompson (January 3, 1883) as a "new" method. We think, however, that Sir Henry Thompson will not consider the case to which Dr. Otis refers conclusive proof of the justice of this statement. Nor do we. The author, in speaking of the merits of the operation, gives a sensible warning against looking upon it as one to be lightly undertaken, and gives cases of his own to illustrate that it may be not only useless, but also dangerous.

With this we are at the end of our necessarily brief analysis. To do full justice to the book would require more space than we can spare. There are many interesting points in it which we have not been able to

touch at all. As a whole it is full of interest and instruction. Being the expression of the results of a long experience it could not well be otherwise. Unfortunately, it has not the advantages it would have were it what, as has already been said, the author did not intend it to be—namely, a systematic treatise. It will be useful to the practitioner who has time to read it, and especially to the writer who wishes to understand the views of one who has had an unusually large experience in the treatment of the diseases of the penis. But for the student and the busy general practitioner we fear its bulk will prove a disadvantage.

C. W. D.

ART. XXII.—*The Principles and Practice of Surgery, being a Treatise on Surgical Diseases and Injuries.* By D. HAYES AGNEW, M.D., LL.D., Prof. of Surgery in the Medical Department of the University of Pennsylvania. Profusely illustrated. Vol. III. 8vo. pp. 784. Philadelphia: J. B. Lippincott & Co., 1883.

“WITH the completion of this volume, the third, of a system of surgery, terminates a task,” Professor Agnew tells us, “which has occupied, for more than five years, whatever moments of leisure have been at my command.” Like its predecessors, it presents the well-established views of surgeons generally, the results of personal observation and experience, matured opinions upon vexed questions of theory and of practice, tabulated records of certain important operations, and more than five hundred illustrations of diseases, injuries, instruments, and appliances, the majority of them prepared especially for this work.

In it are considered the diseases and injuries of the *nose* and of the *air-passages*; of the *eye*, and of the *ear*; of the *mammary gland*; of the *muscles*, *tendons*, *bursæ*, and *fasciæ*; of the *nerves*; of the *lymphatics*; and of the *skin*; together with the more general subjects of *syphilis*, *tumours*, and *malformations*; and finally the surgical applications of *electricity* and *massage*. To properly and justly review a work covering such a field neither time nor space permits; all that can be done is to notice what, here and there, has happened more especially to attract attention.

Believing that, both anatomically and clinically, idiopathic and diphtheritic croup are two distinct diseases, Professor Agnew recommends the performance of tracheotomy in the former, but reserves the operation in the latter for only the “very exceptional cases.”

“Where the signs of local lesions are associated with those of general blood-infection, as seen in the discharges of the nasal fossæ, and in a general exhaustion altogether disproportionate to the obstruction of the air-passages, operations are useless. Many of these patients die independently of laryngeal or tracheal obstruction, and can derive no benefit from the opening of the windpipe, whether the operation is intended to be curative or is done for the sake of euthanasia. . . . When I take into consideration the numerous recoveries under my own observation which have taken place, where operations have been declined, I cannot believe that intrinsically tracheotomy in croup has diminished the mortality of the disease to the extent claimed by a number of writers.”

When the air-passages are opened, tracheotomy is preferred to the operation through the crico-thyroid space, *i. e.*, inferior laryngotomy.

"The operation which consists in puncturing the soft parts and the trachea, and laying both open at a single incision, is a dangerous practice. All such stabs in the dark are reprehensible." Mention is made of the use of the Paquelin thermo-cautery knife "in one case." Since that paragraph was written, such knife has been used many times and very advantageously. In the four cases in which I have myself employed it, I have been much pleased with its action.

Of complete extirpation of the larynx 36 cases are tabulated, of which 30 died.

"While, therefore, the extirpation of the larynx for carcinoma may be regarded as a striking proof of the manual skill of the surgeon, and a remarkable demonstration of the capacity of the human body to endure mutilation, I am far from admitting that it is a triumph of surgery or even a justifiable procedure."

Operative procedures for the relief of deviated nasal septum are regarded with but little favour. "Very much, however, can be done by wedging, if perseveringly maintained."

Under the name of *screatus* is described "a singular neurosis of the nasal passages" not previously described.

Characterized by paroxysms of short noisy inspirations or snortings, . . . continued with increasing rapidity and energy, sometimes for two or three minutes, until probably a small bolus of mucus is hawked up and spat out, or until the patient becomes utterly exhausted, and they cease from lack of muscular power to sustain them."

Congenital club-foot is declared to be "for the most part due to muscular spasm, while the non-congenital is usually the result of infantile paralysis." Tenotomy is strongly favoured, it being asked "why take months to correct a rebellious deformity of the foot, which, with the knife, can be overcome in as many days?" When, in an old case of equinovarus, "from distortion of the tarsal bones and the resistance of the ligaments, correction by tenotomy and instrumental measures is impossible," removal of a tarsal wedge is preferred to excision of the cuboid. The introduction of the former operation is credited to Mr. Colby (Davies Colby) of London. Weber, at Heidelberg, first made it in 1866, his patient dying of hospital gangrene.

In treating of genu-valgum attention is called to the necessity of studying carefully—

"The transverse breadth of pelvis between the acetabula and the length of the neck of the femora, both of which must materially affect condyloid pressure. . . . It is not difficult, therefore, to understand how a little increase either in the transverse diameter of the pelvis or in the length of the neck of the femur would increase the pressure resulting from standing, or even that from muscular contraction, upon the external condyle, and thus cause, while the bones were still in a plastic condition, some absorption of that condyle and the corresponding portion of the tibia; while the growth of the internal condyle, in the absence of the normal pressure, would be increased."

Gradual straightening by the application of the ordinary knock-knee apparatus is duly treated of; but no reference is made to the use of a plaster of Paris splint, which is certainly to be preferred to the wooden splint mentioned as a substitute for the, often times, too expensive apparatus. Of the various methods of osteotomy for the relief of in-knee, MacEwen's is preferred. No mention is made of Didot's operation upon webbed fingers, or of Busch's in the treatment of the "Dupuytren finger contraction."

The statement that after a muscle-wound "the bond of union will be fibrous, muscular tissue not being reproduced when once destroyed," while true as a general statement, is a little too absolute, as regeneration of muscle fibre under such circumstances has been known to take place.

Suturing of divided tendons in old cases of non-union is advised, the surgeon in such case being directed to "adhere in the strictest manner to antiseptic details of dressing."

In the treatment of ganglia the seton is declared to be "entitled to most confidence." A case is reported of bursæ of the extensor muscles of the thumb, which were excised. Larger has recently (*Rev. de Chirurg.*, 1882, p. 403) described a "new tendinous synovial sheath," a little higher up on the radial border of the forearm, which may be the seat of acute crepitating teno-synovitis. Two such cases have come under my own observation during the past year.

In the chapter on the "Surgical Affections of the Nerves," there is given an extensive and valuable table of cases of nerve stretching, "collected for me by Dr. Harte from various medical journals;" which in itself and in the analysis of its 350 cases will prove of much interest to every one interested in this subject. Of the 11 reported cures in 46 nerve stretchings, for tetanus, the author says, "As internal remedies were also administered in these cases the successes cannot be justly attributed to the operations; and yet, as the proportion of cures is greater than ordinarily occurs under internal medication alone, it is scarcely fair to conclude that the nerve-stretching had no favourable effect."

The temperature in tetanus, it is stated, "will, a short time preceding death and for some time after, rise to 110° or 112° ;" *may*, rather than *will*, would have been more correct. "The well-known graphic delineation of a patient of Sir Charles Bell's," it is very justly declared, "portrayed an acrobatic rather than a pathognomonic posture."

It is a little startling, but at the same time comforting, to read in the statement of the symptoms of tetanus and hydrophobia that while the latter disease is always fatal, in the former recovery is "frequent." Chloralhydrate is "the remedy which appears to possess the greatest efficacy;" and a belief is expressed that "many patients perish from too much medication and too little feeding."

In the sub-chapter on *erysipelas*, the membranes of the brain are stated to be *prone* to suffer from inflammatory attacks of this nature, the disease being propagated from the scalp through the vascular connections which exist between the latter and the meninges. Is not this danger of secondary intra-cranial inflammation very much a surgical "bug-bear?" Certainly statistics show that the mortality of simple erysipelas of the scalp and face is but slight. The prodromic affection of the cervical lymphatics in these cases, as the rule, has not been observed. Exception may be justly taken to the breadth of the statement that "the effect of an erysipelatous attack on recent wounds or on ulcerated surfaces is entirely inimical to repair." Not so very seldom it happens that an old ulcer is stimulated to rapid healing by such an occurrence.

The micro-organism cause of the disease is not altogether accepted, the part played by the bacteria being regarded as "still an unsettled question." It certainly is much less unsettled since Fehleisen's investigations and inoculations than it was when these paragraphs were written.

The chapter on *syphilis*, as far as the theoretical part of it is concerned, will be received with less favour than any other in the book. Regarding

the disease as of "prehistoric" beginning, Professor Agnew declares that he is "not disposed to recognize two distinct sources of origin, or, what is equivalent to this, two distinct venereal poisons, one giving rise to hard chancre, and the other to soft chancre;" both diseases being due to a purulent secretion, chancre to some contained "subtle material, possibly a particle of living matter," chancroid to the "purulent component of this secretion." "The possibility of converting a chancre into a chancroid, or *vice versa*, I have no reason to doubt."

An abortive plan of treatment is advised in the early stage of chancroidal bubo. Constitutional treatment, it is thought, should be commenced only on "the first appearance of generalized syphilis," and that treatment the mercurial. A necessary connection between syphilitic arteritis and aneurism is not believed in.

Of the "Hutchinson teeth" it is declared that "many syphilitic children are born and grow up without any of the above distinguishing dental peculiarities, and not only so, but these vices of conformation are sometimes closely imitated by constitutional conditions very different from syphilis, such as rheumatism, rickets, and mercury-poisoning."

Mineral waters, hot springs, etc. are not thought to exercise "any curative power over the disease." Marriage of syphilitics is not sanctioned; and prostitution is believed to be an evil "which comes legitimately within the province of civil law."

To the consideration of tumours much space (one hundred pages) is devoted. The subject is treated both generally and specially, and is illustrated by a large number of wood-cuts of microscopic and macroscopic appearances; the former taken from Dr. Formad's *Manual of Microscopic Diagnosis*, and drawn, the "most of them, from specimens furnished from my own operations."

Three conditions, it is held, are "necessary to the development of a morbid growth, namely, structural peculiarity, a specific irritant, and inflammation. . . . The absence of any one of these factors will be fatal to the active manifestations of the remaining two." In this connection it is interesting to notice the declaration that "muscular contusions often constitute an important factor in the genesis of morbid growths, especially sarcoma." Assuming an epithelial origin of carcinoma, and recognizing the marked predisposing agency of hereditary antecedents, the local origin of the disease is not accepted, though the exciting influence of local traumatism, with their resulting inflammation, is strongly insisted upon. The liability of old ulcers to carcinomatous degeneration is duly referred to.

Six varieties of the disease are described: "the epithelial, scirrhus, encephaloid, telangiectatic, colloid, and melanotic;" in none of which is medical treatment of any kind of any benefit, except in so far as it may relieve pain and improve the general condition. The introduction of Chian turpentine is credited to "a London physician." Surely John Clay, of Birmingham, is entitled to recognition by name and proper residence; if his remedy has proved, like all the rest, of no value, it certainly was introduced, used, and reported upon in a very different way from *condurango*. Excision is preferred to every other method of surgical treatment, the use of caustics being limited to "cutaneous carcinoma," and then only "when patients are unwilling to submit to excision." In mammary cancer, however, operative interference is, it would seem, not very much favoured, except as, in properly selected cases, increasing comfort and pro-

longing life. The disease is thought to return with almost absolute certainty, though even then it is advised to remove secondary tumours "so long as there are no signs of internal deposits."

"I do not despair of carcinoma being cured somewhere in the future, but this blessed achievement will, I believe, never be wrought by the knife of the surgeon. We may hope, however, for the discovery of some drug which, operating through the general system, will follow and destroy the vagrant cells, and do for cancer what mercury and the iodide of potassium have done for syphilis."

The concluding chapters upon *electricity*, *nerve-stretching*, and *massage*, though brief, are interesting and of value.

The volume (indeed the whole work) is remarkably free from typographical errors, only a very few of them having been noticed. It is to be regretted that the majority of these are in the spelling of proper names, a notable fault in Continental books, but one which ought not to be permitted to occur in those published in this country.

In here bringing to a close this notice of the third volume of "Agnew's Surgery," it only remains to express the pleasure had in even hurriedly glancing over, still more in carefully reading, the chapters of the several volumes of this valuable contribution to American professional literature. Its author should never regret the use made of the leisure moments of more than five years. May the future fully compensate him for his studies and his labours! In a new edition a rearrangement of the chapters may advantageously be made.

P. S. C.

ART. XXIII.—*Centuria di parti prematuri artificiali provocati*. Dal Dottor CESARE BELLUZZI, dal 1860 al 1882. Bologna, 1883.
One Hundred Premature Parturitions Artificially Induced. By Dr. CESARE BELLUZZI, from 1860 to 1882. 4to. pp. 33. Extracted from Series IV. Vol. V. of the *Memoirs of the Academy of Sciences of the Institute of Bologna*, and read at the session of April 8, 1883. Bologna: Gamberini & Parmeggiani, 1883.

THE first memoir upon the same subject, presented by Dr. Belluzzi, was read before the Academy of Sciences, at its sessions of February 26 and March 7, 1874, and appeared in its Bulletins of October and December, 1874, and February, 1875; it contained the records of 59 cases. The second memoir, which is a continuation of the first, and more especially under review, presents the results of 53 cases; which, with the preceding, gives a record of 112 cases; of which forty-two were treated in private practice, and seventy in the Maternity of Bologna.

Artificially induced labour was excited nine times for disease of the mother; once, because in all previous gestations the fœtus had died in utero during the ninth month; and one hundred and two times in contracted pelvises. Of these 102 cases, six died; three out of thirty-eight in private practice, and three out of sixty-four in the hospital. Of the nine women operated upon because of the existence of grave diseases, seven recovered. Thirty-five out of forty-two infants were delivered alive in private practice, and the still larger proportion of sixty-two out of seventy in the Maternity. The subsequent mortality of the latter was, of course, much greater than

of the former, as very intelligent care in feeding, and sustaining the temperature of the body in premature infants, is requisite to their being kept alive until full infantile vigour is attained.

The author presents the following comparative table of the results attained in hospital practice, by artificially-induced parturition, in cases of pelvic contraction :—

Hospitals.	Accoucheurs.	Cases.	Death of mother.	Fœtus stillborn.	Survival of children.
Maternity of Bologna, 1862-82	Dr. Belluzzi	64	3	7	29 lived through the month.
Obstetric Clinic of do. 1873-82	" Massarenti	33	2	4	21 living at end of 5 to 12 days.
" " Padua "	" Frari	9	0	2	3 " " some "
" " Palermo "	" Pantaleo	11	1	4	4 " " " "
" " Rome "	" Pasquali	27	3	14	8 " " a month.
Maternity of Brussels	" Hyernaux	28	2	10	9 " " 10 days.
Obstetric Clinic of Liège, 1857-18	" Wasseige	41	1	5	6 " " 10 "
Maternity Hosp. of Paris, 1873-82	" Tarnier	37	1	12	4 " " 9 to 15 days.
		250	13	58	

Collectively, as shown by this table, the proportion of deaths in the mothers is a fraction over 5 per cent., and of the children a little over 20 per cent.

To the above record of cases we may add that of Dr. Ludwig Winckel, of Mülheim, Germany, who delivered twenty-five women, all affected with contracted pelves, from the year 1846 to 1876. These patients all recovered; their ages ranged from twenty-one to forty-five years. Two were delivered in the thirty-first week of pregnancy; ten in the thirty-second; twelve in the thirty-third, and one in the thirty-fourth. Fourteen children were still-born, and thirteen were living. Of the thirteen, only seven were alive at the end of two weeks. The shortest conjugata vera was $2\frac{1}{2}$ inches; woman delivered in thirty-second week; fœtus dead. The patient delivered at the close of the thirty-first week had a conjugate of $2\frac{9}{16}$ inches; the fœtus was dead; the two mothers were both rachitic.

As the ultimate saving of the fœtus is one of the objects of the production of premature labour, Dr. Belluzzi has been careful to present the record of his cases at various periods after delivery; by which we learn that prolonged vitality in the fœtus is largely dependent upon the period in gestation which is chosen for the operation, or which the condition of pelvic stenosis will admit of being selected as the latest, with safety; the fœtus of eight months being much more readily saved than seven and a half, and the latter than that of seven months. He recommends that in hospital practice the cases should be kept in the institution for a much longer period than usual; that the premature infant should be fed by drawing the milk for it rather than by suction on its part; and that an artificial heating apparatus adapted for the purpose should be used to impart warmth to it. He estimates the measure of the true conjugate diameter of the pelvis, below which there is little hope of the survival of the fœtus, at 3 inches (7.5 cm.); admits that it is possible to save the fœtus in rare cases down to $2\frac{3}{4}$ inches (70 mm.); but denies the possibility of so doing below this limit. He appends to his monograph a collection of ten phototypes of the children saved by him, in the Maternity,

taken at various ages, ranging from a well-developed woman of twenty to a little girl of less than two years of age; the others being respectively fifteen, fourteen, thirteen, ten and a half, ten, eight, seven, and five years old, six being girls, and four boys. These pictures were nearly all taken in the fall of 1882, and constitute a very interesting collection, and one highly creditable to the skill and care of the accoucheur.

Dr. Belluzzi, with regard to the extremes of pelvic stenosis in his cases, says, that in his private practice the conjugate measurement ranged from $2\frac{7}{8}$ inches to $3\frac{3}{8}$ inches, with the exception of one case in which it was only $2\frac{1}{16}$ inches; and in the Maternity from $2\frac{3}{4}$ inches to $3\frac{1}{2}$ inches, with the exception of two cases in which it was $2\frac{1}{4}$ inches and $2\frac{1}{16}$ inches respectively.

The hospital mortality will be shown by the following in the record of 32 infants born alive out of 36 in the period from March, 1873, to November, 1882, viz.: Died in quarter hour, 1; five hours, 1; eight hours, 1; twenty-two hours, 1; one day, 2; four days, 1; five days, 2; seven days, 1; ten days, 1; fourteen days, 1; twenty-eight days, 1; one month and one day, 1; one month and two days, 1; one month and four days, 2; two months and six days, 1; three months and six days, 1; five months, 1; five months and three days, 1; five and a half months, 1; five months and nineteen days, 1; six months, 1; eight months, 1; eleven and a half months, 1; one year, 1; seventeen months, 1; and two years, 1. Three were living when the report was completed; two aged seven and a half years each, and one twenty months, out of the thirty-two.

The private practice of the author, and in which record we are more interested, shows a less discouraging mortality, viz.: From May, 1874, to September, 1882, he delivered 17 women prematurely, and saved 14 children. Of these 1 lived fifteen minutes; 1 some days; 1 two or three days; 1 two days; 1 four days; and 1 twelve days. Eight were still living at the time of writing the report, aged respectively about six months, ten months, one year (2), two years (2), and three years (2). In the previous memoir there were 25 cases, with 21 children born alive. This record embraced the period from 1860 to 1873.

Nine of the children were dead when the table was completed in 1873, and twelve were living, but at what ages we cannot tell, not having at hand the full report then given. We have then twenty children out of thirty-five that lived to a period to render their expectancy of life equal to that of infants, and children of their respective ages that have had the advantages of a full period of intra-uterine development.

Although the proportion of women in our own country requiring to be delivered prematurely is comparatively small, still there are many more than those thus treated by their accoucheurs. As the mortality in Bologna has been very small in the mothers, there is much to encourage our accoucheurs in imitating the example of Dr. Belluzzi, and thus to avoid the greater risks of delivery at full term. With the advantages of raising premature infants in private families, where they are frequently saved by the care and attention given, we ought to be able to rear a fair proportion of those saved from the perforator by an artificially induced labour. We have seen such small children raised in this city that we need not despair of doing the same with those hurried into the world of necessity by artificial means. The reviewer well remembers a large, tall woman, who died at the age of eighty-seven years, telling him, a long time since,

that she was a seven months' baby, and so small and delicate at birth that she was kept wrapped in wool for three weeks, and not dressed until that age. As she was born about the year 1771, and saved under the disadvantages of that period, we ought certainly to be able to do as well now with the fœtus of seven and a half to eight months. R. P. H.

ART. XXIV.—*A Manual of Pathology.* By JOSEPH COATS, M.D., Pathologist to the Western Infirmary and the Sick Children's Hospital, Glasgow; Lecturer on Pathology in the Western Infirmary; Examiner in Pathology in the University of Glasgow; Formerly Pathologist to the Royal Infirmary, and President of the Pathological and Clinical Society of Glasgow. With three hundred and thirty-nine illustrations. 8vo. pp. 818. Philadelphia: Henry C. Lea's Son & Co., 1888.

WE are very glad indeed to welcome a manual of pathology from the pen of this author, who has become so favourably known to the medical world by his work in the direction of pathological anatomy and in other ways. He has been led to its publication, as he states in his preface, by the want of a complete English text-book, so much felt by himself as well as by others engaged in teaching pathological anatomy. The author has sought to give his text a somewhat more extensive scope than has been commonly attempted in the usual text-books, by including such parts of general pathology as help most particularly in forming a general conception of each morbid condition.

Part I. is devoted to a short introductory, followed by the discussion of *General Diseases* (pp. 285). Of these first come affections of the circulation and of the blood, such as hyperæmia, thrombosis, embolism, and certain of the hemorrhages, which are treated of briefly but very satisfactorily; there are also short articles on leukæmia, uræmia, and diabetes mellitus, which are not often so clearly described in a short space, and often are entirely omitted. Then follow inflammation, the retrograde metamorphoses, hypertrophy, repair, and the regenerations, the infective tumours, such as syphilis, tubercle, etc., and the morbid growths. His chapter on the parasites, vegetable and animal, contains a good deal of matter not readily come at except in a large library.

Part II. takes up the *Special Organs and Systems*. Some parts we should like better if they were fuller of matter; for example, more on the subject of changes in the form of the heart; a separate heading for dilatation finds place neither in the table of contents nor in the index. The section on the *Nervous System* is unusually full, and very well and very fully illustrated; in many respects it will be found more useful than some works we know of entirely devoted to this subject. The *Respiratory Section* is brief, but very clear and practical; its brevity has certainly shorn it of many parts which would have been especially confusing to the readers for whom the book is intended. The other sections seem to present the various morbid changes with sufficient fulness to render these portions of the work of marked value.

We would call especial attention to the illustrations. To any one purchasing the volume, we have to say that they will fully receive the worth

of their money in this item alone. In many recent works of both normal histology and morbid anatomy, it is somewhat difficult from the illustrations alone to tell whose books one is looking at. Coats's pictures are mostly original, and are very good; some, of course, are copied, but the selection has been well made, and from sources as yet not too much borrowed from already. The book will be found a very decided and valuable addition to the library of pathology. M. L.

ART. XXV.—*A Practical Treatise on Materia Medica and Therapeutics*. By ROBERTS BARTHOLOW, M.A., M.D., LL.D., Professor of Materia Medica and General Therapeutics in the Jefferson Medical College of Philadelphia, etc. Fifth edition, revised and enlarged. 8vo., pp. xxii, 738. New York: D. Appleton & Co., 1884.

A BOOK which has reached its fifth edition so rapidly as this has done, and upon which the profession has passed so favourable a judgment, hardly stands in need of a review, or of having its merits pointed out. It is not out of place, however, to note that it has been kept fully abreast of the many and important changes constantly making in the knowledge of drugs and their application to disease, to say nothing of hydro-, electro-, and metallo-therapeutics, all of which are thoroughly treated in this edition.

In so popular a work as this it is perhaps more useful, if not so agreeable, to point out some of the faults which diminish its usefulness. Barring a few careless expressions, undoubtedly due to haste, they are not many, but of such a character as to justify a warning to the too confiding practitioner, lest he be doomed to early and frequent disappointment.

The author has evidently lost but little of his enthusiasm, and this mental status undoubtedly contributes largely to the success of the book. While Dr. Bartholow is far from being unaware of the fallacy of *post hoc*, etc., it seems to us that he has not infrequently either fallen into it himself, or accepted too readily the statements of others founded thereon. An instance of the reversal of "conclusions," even between two editions, is to be found on page 234, where he says "recent experience has *conclusively* shown the curative power of iodine in malarial fevers." . . . "Some recent experiences by Dr. Atkinson, of Baltimore, throw doubts on the previous statements. He found that iodine failed in two-thirds of the cases of intermittent fever."

He accepts too easily the statement of Dr. Barker (page 252) (which, however, he characterizes as "doubtful"), to the effect that "if (turpeth mineral be) given early, a fatal result (in croup) will most certainly be averted." Notwithstanding Dr. Barker's confidence, and the wide-spread publicity of his views, practice, and, unfortunately, its results, have remained essentially the same.

It is of course impossible at the present time to point out all the statements of this kind which the author will be called upon to modify in the many editions which are undoubtedly to follow; but if the experience of the past be any guide, they are not a few. Like many progressive therapeutists, he is not unduly respectful toward the traditions of the ancients, but he does not seem sufficiently mindful that the evidence upon which

many modern theories are founded is but little stronger, and of much the same character, as that which is rejected when urged in behalf of the older ones. The difference between new and old is not the same as that between true and false, even when the former is expressed in a little more exact physiological terms. It is no more than fair, however, to modify even this criticism, by saying that the author is quite as rigorous toward his own personal results as toward those of others, and perhaps it would be just to attribute his somewhat facile reception of over-confident assertions to politeness, rather than to want of due criticism. We cannot help wishing, however, that Dr. Bartholow had tempered his work with a little more discriminating skepticism; but, as it is, the physician must do this for himself, and will then find this book one of the most useful, and a credit to American literature. If he follows its guidance, he will have the consolation of feeling, even amid the failures which are the lot of all, that he has done for his patients all that medicine could do.

Let it not be inferred, from this page being devoted to criticism rather than to praise, that the great value of the work fails of appreciation. Its faults, rather than its merits, are pointed out because the latter are so thoroughly well known both at home and abroad, and its claims to admiration, in which the writer cordially shares, are so universally recognized.

R. T. E.

ART. XXVI.—*Elements of Histology*. By E. KLEIN, M.D., F.R.S., Joint-Lecturer on General Anatomy and Physiology in the Medical School of St. Bartholomew's Hospital, London. Illustrated with 181 engravings. Pocket-size 12mo., pp. 352. Philadelphia: Henry C. Lea's Son & Co., 1883.

THE name of the author of this little book is so identified with this department of medical science, that any contribution from his pen must always command attention. With his own views so recently definitely stated in the admirable "*Atlas of Histology*," it is to be expected that a volume designed as a manual for students would, to a considerable extent at least, be a repetition of already expressed opinion. Such, in fact, is the present book, being largely an abridgment of the more elaborate text of the atlas, adapted to the present purpose, the descriptions being condensed or expanded as the exigencies of the subjects seemed to demand. Any extended review of the text, with that of the atlas so well known, seems superfluous; suffice it to say that the views regarding special points, as the intracellular networks, are fully carried throughout the manual. Of necessity, that attractive feature of the atlas—the illustrations—is largely lost, these being reproductions as cuts of many of the lithographic drawings of the atlas, as well as of those found in the "*Handbook for the Physiological Laboratory*," with a few additional ones from various special sources.

It is greatly to be regretted that, in a book especially designed for students, the statement of the amplification of the figures has been entirely ignored. By those having no knowledge from direct observation, how are definite ideas as to the relative size of various elements to be acquired where no magnifying power is indicated with illustrations, and where single cells sometimes appear larger than whole groups in other figures?

“Highly magnified” and “low power”—so common in books—are very indefinite and unsatisfactory substitutes for amplification expressed in figures, even if these be but approximately correct. To give the latter would have been no difficult task, since the enlargement of all original figures is accurately stated in the atlas, from which data the figures appropriate for the reduced cuts could readily be determined; this neglect is of frequent occurrence, but nevertheless to be condemned, as exact ideas and comparison of drawings are rendered much more difficult.

As the atlas at once commanded a place among the valued volumes of the special worker, so will the “Elements” be welcomed by the large number whose needs hardly warrant the purchase of the more expensive work, yet who desire concise and accurate knowledge as to the present development of histology. This need is more than filled by the present volume. While “elements” is an appropriate term when considering the great mass of described histological minutiae, yet it is almost a matter of surprise how full and minute are the descriptions here found, the minute anatomy of many tissues and organs being presented with greater thoroughness than in works of far more pretension. This has only been accomplished by the adoption of the most concise descriptions; sometimes, perhaps, to the sacrifice of the explanations which would be desirable, in consideration of the presupposed ignorance of the young student; where every sentence is loaded with important statement, the tyro often fails to gain conceptions as definite and lucid, as where texts admit of descriptions more extended.

The fact of the book being a member of the “Student’s Series of Manuals” must be the apology for its appearing as an under-sized 12mo., a form quite out of keeping with the volumes by whose side this excellent book should find its place; it is to be hoped, however, that at some future day the publishers may see fit to furnish it also in the more desirable form.

G. A. P.

ART. XXVII.—*A Treatise on the Diseases of the Eye.* By J. SOELBERG WELLS, F.R.C.S., Doctor of Medicine of the University of Edinburgh; Professor of Ophthalmology in King’s College, London; Ophthalmic Surgeon to King’s College Hospital; and Surgeon to the Royal London Ophthalmic Hospital, Moorfields. Fourth American, from the third English edition, with copious additions by CHARLES STEDMAN BULL, A.M., M.D., Lecturer on Ophthalmology in the Bellevue Hospital Medical College; Surgeon to the New York Eye and Ear Infirmary; Ophthalmic Surgeon to the Nursery and Child’s Hospital, and to St. Mary’s Free Hospital for Children. Illustrated with 257 engravings on wood and six coloured plates, together with selections from the test-types of Prof. Ed. Jaeger and Prof. H. Snellen. 8vo., pp. 846. Philadelphia: H. C. Lea’s Son & Co., 1883.

LESS than three years have passed since we were called upon to notice the third American edition of this work, and the early demand for a fourth proves that we did not place too high an estimate upon its value. Quite a number of additions have been made since the last revision, to some of which it may be of interest to call attention. Among them is a descrip-

tion of an operation for entropium, which, with various modifications and under different names, has been a good deal discussed in the last few years. The editor speaks of it as a modification of Von Ammon's operation proposed by Von Burow.

"The lid is everted and the point of the knife is pushed through the tarsus near its outer end, a line or more from the cilia, and carried along between tarsus and muscle from the outer to the inner end. If the tarsus is very much thickened a wedge-shaped piece should be cut from the upper side of the incision. A narrow strip of skin is then excised from the length of the lid, and then from three to five sutures are inserted in the skin and the external wound closed. The incision through the tarsus may be made with a pair of scissors. This operation has been done by Green, of St. Louis, with good results."

Dr. Green, however, claims that he has made several important practical modifications in the operation as done by Von Burow; that Von B. makes the incision through all the tissues of the lid, instead of sparing the muscle, and excises a broad fold of integument, depending upon the traction of the skin resulting from bringing its edges together with superficial sutures, to keep the margin of the lid everted. In Dr. Green's operation—

"The needle is first introduced a little to the conjunctival side of the row of eyelashes, and is brought out just within the wound made by the excision of the strip of skin; it is then drawn through, inserted again in the wound near its upper margin, and passed deeply backward and upward so as to graze the front of the tarsus and emerge through the skin of the eyelid a centimeter or more above its point of entrance. On tying the two ends of the thread together the skin wound is closed, and the loosened lid margin is at the same time everted and brought into a correct position."

We have operated several times in accordance with his directions, with very satisfactory results. In the treatment of cicatrices of the face involving the lids, the editor has had a very favourable experience with the use of massage, as recommended by Dr. D. H. Agnew for hastening the process of interstitial absorption: when a depressed scar is adherent to the bone, he first performs Mr. Wm. Adams's operation of subcutaneous division of the adhesions.

The subject of diphtheritic conjunctivitis is more freely discussed than in the last edition. The editor admits that the pathogenesis of the disease is still in an unsettled state, and agrees with the modified statement of Von Grafe that "while in many cases diphtheritic conjunctivitis is a symptom of a general disease, yet there are cases in which it is a local disorder caused by infection with the secretion from a purulent conjunctivitis." In the chapter on granular conjunctivitis, an account is given of the recent investigations of Sattler upon the nature of trachoma. Sattler denies that lymph follicles exist in the normal conjunctiva, and regards the trachoma granules as a characteristic and specific product of the trachomatous process, the cause of which he thinks he has found in a special form of micrococci. He claims to have succeeded in cultivating the micrococci and producing positive results by inoculation with the third generation. Since this work went to press, Sattler has made careful and elaborate investigations into the nature of the ophthalmia produced by jequirity, concerning which, as a means of treatment in cases of obstinate trachoma, there has been lately so much discussion. It has been supposed by M. Wecker that the cause of the jequirity ophthalmia was some vegetable ferment, but Sattler could not succeed in extracting any chemical

product whose action was at all like that of the fresh infusion. He concludes that there is a bacillus which acquires in the jequirity infusion the property of producing this distinct form of ophthalmia when brought in contact with the conjunctiva. His theory of the cure of trachoma by jequirity ophthalmia, is that the micro-organisms of trachoma and those of jequirity cannot live at the same time upon the conjunctiva; that there is an irrepressible conflict between these opposing forces, in which the trachoma micrococci are driven from the field.

A considerable addition has been made to the chapter on Glaucoma, in which a *résumé* is given of the recent investigations made by Knies, Weber, Schnabel, Mauthner, Priestley Smith, and Brailey. It cannot be claimed, however, that these investigations have established the pathology of the disease or the theory of its cure on anything like a positive or generally accepted basis, and the subject is still, to a great extent, an open one.

The editor has, perhaps, given less attention to the chapter on Refraction and Accommodation than to most other parts of the work. The directions for the detection and correction of astigmatism might be made more definite and fuller, and more helpful to the beginner; and the entire ignoring of the metric system in the numeration of lenses is a very serious defect.

The quality of the paper and type is excellent, and the mechanical work upon the volume has been carefully and thoroughly done; altogether, the present edition maintains the standard of its predecessors, and keeps this old favourite still in the front rank of ophthalmic text-books. G. C. H.

ART. XXVIII.—*The Pathology and Treatment of Venereal Diseases.* By FREEMAN J. BUMSTEAD, M.D., LL.D., Late Professor of Venereal Diseases at the College of Physicians and Surgeons, New York, etc. etc., and ROBERT W. TAYLOR, A.M., M.D., Professor of Venereal and Skin Diseases in the University of Vermont, etc., etc. Fifth Edition. Revised and rewritten, with many additions, by Dr. Taylor. With one hundred and thirty-nine wood-cuts and thirteen chromo-lithographic figures. 8vo., pp. 906. Philadelphia: Henry C. Lea's Son & Co., 1883.

THE recently issued fifth edition of this standard American treatise on venereal diseases deserves special consideration, chiefly because of the change announced in its authorship. Fortunately for the success of its future, this change has been gradually effected, and has, moreover, been one well calculated to enforce the authority and enlarge the prestige of the book itself. The fourth edition was, as is well known, the first in which the labours of the late lamented Dr. Freeman J. Bumstead were aided by those of Dr. Taylor. Scarcely, however, had that edition been placed in the hands of its reviewers, when the senior author ended with his life the regretful companionship of his colleagues. This is, therefore, the first edition for whose utterances Dr. Taylor is solely responsible.

A careful comparison of the volume with its several predecessors justifies the conclusion that the revision of the text has been judiciously and conscientiously made. Thirteen chromo-lithographic figures have been added, which will prove of some service to students, and also to medical men who are unfamiliar with the chief lesions represented. Dr. Taylor has also in this edition set forth the claims of the fluid extract of eryth-

roxylon coca as an adjuvant of other remedies employed in the treatment of syphilis. Without doubt a trial will be made of this medicament to an extent which will fairly test its value as a remedial agent. A brief chapter on syphilis and marriage has been wisely added, the necessity for which was clearly imposed by the appearance of Fournier's superb monograph on the same subject. The body of the work has been thus enlarged by about seventy pages.

The relation of micro-organisms in general to the diseases whose importance had entitled them in these pages to chief consideration is briefly discussed by Dr. Taylor. He judiciously avoids any explicit commitment of himself to the etiological importance of these germs, the facts certainly not warranting at this time any positive assertions. We should be tempted to believe that, if this etiological question were to be settled by therapeutic experiment, it would soon be transferred from the clinical amphitheatre to the closet of speculation; to believe, in fact, that if the germ theory of these diseases were to stand or fall by the success or the reverse of a treatment specifically directed to the destruction of the micrococci of gonorrhœa and syphilis, the results thus far obtained would weigh rather heavily on the unfavourable side of the scale. But the well recognized difficulty of promptly relieving diseases whose etiological factors are capable of much more exact demonstration, should lead us to be cautious in hastily inclining to either the one side or the other of this newly joined issue.

As it comes to us to-day, it is impossible to refuse the tribute which this volume both invites from its students and commands from its critics. It is a splendid record of honest labour, wide research, just comparison, careful scrutiny, and original experience, which will always be held as a high credit to American medical literature. No single man, indeed neither one of its authors, could sit down to-day and *ab origine* compose either it or a similar work of equal value. It represents to us that which is valuable, skilfully and laboriously rescued from an alluvium of twenty years' deposit. The physicians of this country have come to regard it as an old friend, and even to entertain a certain degree of affection for its familiar pages.

It is precisely for this reason that our author should seriously determine, in the subsequent editions which will certainly be demanded, to reduce the size of the volume, which should none the less include every new suggestion possessing any practical importance. Much of its material might be more concisely written; some of its pages add but little to its value; and a few facetious comments which meet the eye neither illustrate the worth nor add to the dignity of a standard text-book.

The subject, for example, of visual exploration of the deep urethra, is one of no little interest. "Instruments of precision," as they are often called, have an especial attractiveness for men of science. If the promise of the wood-cut were fulfilled in the performance, all would be well. It is not pleasant to admit that our natural powers are limited, and that their instrumental aids are more curious than useful. Such, however, must often be the verdict as regards endoscopy. If everything which it has taught or shown during the years which have elapsed since its introduction were suddenly lost from the sum of human knowledge, few physicians or patients would be for this the worse. The Désormeaux apparatus, still figured here on the 106th page, is expensive, clumsy, and practically a useless instrument, which still encumbers the armamentarium of the sur-

geon, possibly because every one thinks that it ought to be able to do what it is intended to, but really cannot, do. It is far inferior to the more recently devised but much more complicated contrivance of Leiter, by which the mucous lining of the bladder and urethra is illuminated by incandescent platinum. We have, however, with this latter carefully inspected the entire vesico-urethral tract when in a state of active inflammation, with net results practically limited to an appreciation merely of colour changes. He who has carefully studied the lesions perceptible in a naked eye observation of the mucous membrane in gonorrhœal conjunctivitis, has a far more perfect picture of the same changes in the similarly involved urethra, than can be gained by the endoscopy of this day. By as much as, for the wise physician, the tongue is an index to the condition of the deeper membrane which lines the distant stomach, by so much is the aspect of the mucous membrane visible on separation of the lips of the meatus urinarius an index to the condition of the deeper and distant portions of the same tract.

There are other points which will doubtless suggest themselves to the author when he imposes this future task upon himself. He will decline, for example, to recommend the mensuration of urethral sounds by passing them through circular apertures cut in either cardboard or steel, a procedure by which only those dimensions can be ascertained which are represented by the number of apertures. Even the manufacturers of wire have improved upon this. Nor will he attempt to establish the diagnostic characters of chancre and chaneroid, by artificially squeezing into parallel columns items relating to the depth, size, edge, and secretion of the ulcer of primary syphilis, when it may be truthfully said that the majority of all such lesions are strictly initial scleroses, of which ulceration is always an accidental and rarely an important feature of the main process in each case. The text, however, on this point is far wiser than the table, since it sets forth very clearly the predominant features of the chancres of every grade and locality which are there described.

There is yet another among the changes which the syphilographic future will require, to which it is here proper to refer. It is a change desirable, not only on the ground of consistency, but also of utility. It concerns the vexed but important question of nomenclature. Mr. Hutchinson, of London, has been sharply criticized for his compounding of several terms in order to name a single disease, as, for example, in his "lupus-psoriasis" and "cheiro-pompholyx." But such terms as "impetigo-form syphilide" and "ecthyma-form syphilide" are none the less open to objection. It may be regarded as unphilosophical, and it is certainly confusing, to name and describe one disease in terms of another. It goes without saying that such a course implies and requires a knowledge of the one malady before the name—to say nothing of the nature—of the other can be grasped by the mind. The earlier astronomers refused to name one constellation of stars by any supposed resemblance to another, and turned for their titles to the beasts, the birds, and the fishes of the more tangible sphere on which they lived. Our anatomists, to come nearer home, have never named liver and bone because of a resemblance to kidney or muscle, but gained their end by the aid of substantives suggesting a key, a hammer, a ship, a sword, etc. The earlier dermatologists, too, selected a honey-comb, a fig, a live coal, a bubble, etc., as the objects by the aid of which they might compare and designate certain of the disease-symbols of the skin.

Nor is this all. When we speak of an "acne-form syphilide," the question most naturally suggested is: Which one of the eight or ten described forms of acne does the syphiloderm most resemble? We do not, however, ask this question because, as a result of previous observation and training, we know precisely what is intended; but for him who has not learned as much, the question will always be implied or expressed. Again, in that curious series of metamorphoses portraying to the eye the evolution of the variolous lesion, extending from the earliest maculopapule to its final crust, at what point shall we find the type of the "variola-form" syphiloderm? Here again we know how to reply, but we only know it because we have studied the two diseases in greater or less detail, and are thus able to see the physical basis for either a comparison or an analogy.

We have brought forward this issue in this connection as one which should be recognized in the future editions of this standard treatise. It involves, however, no reproach for the writers of this book. They had and have the highest authority for the usage to which they conform, among the syphilographers both in their own and other tongues. They have but done their duty in reproducing in these pages the terms whose long currency has identified them with certain definite cutaneous symptoms of syphilis. Nowhere so well as here, however, can a change of this character be wrought, a change so conspicuous and effectual, that it will be largely followed in an effort to drop misleading and confusing titles. Americans have done great service in banishing from medical literature the incongruity of "syphilitic eczema," "syphilitic psoriasis," and their brood; and can without question do as much again in the same spirit.

We do not hesitate to express the belief that this is not only the best work in the English language upon the subjects of which it treats, but also one which has no equal in other tongues for its clear, comprehensive, and practical handling of its themes. With respect to the appearance of the book, including its typography and illustrations, we have merely to conclude by saying that the well-known publishers have done their part with their accustomed skill and taste.

J. N. H.

ART. XXIX.—*The Causation of Sleep.* By JAMES CAPPIE, M.D.
Second edition. Rewritten. 8vo. pp. 207. Edinburgh: James Thin,
1882.

SLEEP is one of the familiar mysteries that science has yet to solve. Physiologists are of accord that it is accompanied by a diminished blood-supply to the brain—a relative cerebral anæmia. There is enough direct evidence in unassailable facts to support this view. But the mechanism by which such physiological ebb tides are brought about has not yet been made clear in such a way as to fully meet the requirements of all the phenomena of even healthful sleep. Nor has a theory yet been devised to explain the relation which the consciousness of sleep holds to that of various pathological conditions, such as hebitude, somnolence, coma-vigil, stupor, coma. Yet these conditions show resemblances and contrasts to sleep that must be understood if we are fully to know what sleep is, or

else which can only be explained when the mechanism of sleep itself is known.

The author's theory of the causation of sleep is set forth with greater fulness and exactness than heretofore, and he is at some pains to weaken the position of those who have, at various times, opposed his views. He urges strong objections against the theory that during sleep the whole mass of blood within the skull is diminished, and that this loss in the volume of the intra-cranial contents, is made up by a corresponding augmentation of cerebro-spinal fluid. His own view, in brief, is that the mass of blood remains constant, or practically so, and that during sleep there is an alteration in the balance of the circulation between the brain-substance and the venous system of the pia mater. A diminution of the functional activity of the brain, which means diminished molecular movement, is coupled with flagging capillary circulation and a reduction, *pro tanto*, in the volume of the brain; this is compensated by a turgescence of the venous system of the pia sufficient to exert a direct pressure upon the whole surface of the organ. With this pressure comes the unconsciousness of sleep. In the production of this venous turgescence the atmospheric pressure upon the veins of the neck is "an essential agent."

The argument to sustain this theory is ably and clearly stated, but it remains an argument. It does not amount to a demonstration. Valuable collateral evidence is brought forward, and treated with no little skill, but the direct evidence of experimental research, by which alone a theory of this kind can be supported, is wanting.

The book is illustrated by two excellent coloured drawings, showing in contrast the appearance of the retina of a girl in her ordinary health and in profound epileptic coma.

J. C. W.

ART. XXX.—*Enteric Fever; its Prevalence and Modifications, Etiology, Pathology, and Treatment, as Illustrated by Army Data at Home and Abroad.* By FRANCIS H. WELCH, F.R.C.S., Surgeon-Major, A.M.D. (*Alexander Prize Essay*, December, 1881, modified.) 8vo. pp. 190. Philadelphia: Presley Blakiston, Son & Co., 1883.

As a contribution to the subject of enteric fever from an unusual source, the present volume has peculiar value. The great mass of facts concerning this disease are the results chiefly of the labours of medical men in civil life in Europe and the United States. The natural history of the disease, its course, duration, termination, its symptomatology, its complications, the average death-rate, have come, during the years that have elapsed since Bretonneau, Chomel, and Louis made it known, to be familiar knowledge. It is to be confessed that the ancient clouds overhang its etiology and treatment; yet, even upon these, light appears to be about to break. In private and in hospital practice we know it to be substantially the same disease. We recognize its conformity to type under the various forms that it occasionally assumes, and we have come to regard it as the great fever of the present day, just as the plague was the great fever of the middle ages, and typhus the great fever of the period intervening between the termination of that historical period and the present. But en-

teric fever is by no means a disease of limited prevalence. It is of the widest geographical distribution, having been encountered in all countries and in every climate. Hirsch concluded, however, that its general prevalence in Europe and America dates no further back than the second and third decades of the present century—that is, from the period at which typhus (*der Petechialtyphus*) became less common, and in part disappeared altogether. It is certainly true that enteric fever has within the last two decades become endemic at many widely separated points in both hemispheres, where it was previously not an unrecognized, but an altogether unknown disease. To observers in the old countries, questions as to the behaviour of the disease in its new habitats naturally arise. What are the effects upon it of climate, of altitude, of unaccustomed soils, and modes of life? Are there modifications of intensity, of duration? Are there regions especially favourable to the development of this disease, or are there localities blessed with a relative or absolute immunity from the action of its infecting principle?

The author, investigating enteric fever from the standpoint of the military surgeon and basing his deductions upon the army data of the British service, seeks to show the relation of the disease as it is known in England, which is in fact as it is known to us, to that of the world at large.

We learn with surprise that, prior to 1859, enteric fever was returned with other forms of febrile diseases under the generic term “continued fevers.” From that date most of the stations return it as “typhoid,” and since 1869 it has been returned as “enteric.”

Between 1859 and 1878—the author’s statistics appear to be limited to this period—the white troops suffered from this disease in every quarter in which they were called upon to serve, except Newfoundland, British Columbia, west coast of Africa, and the Fiji Islands, a single case only having been returned during that period from St. Helena. Native troops at the stations where they are employed have also suffered from it, but in diminished ratio.

In temperate climates, the conditions are “less favourable to the production” of enteric fever than in tropical or subtropical stations. When the disease occurs in the latter the tendency is to greater severity of type, and a higher proportionate death-rate. The elevated stations of India are not exempt, and the mainland of India suffers to a degree second only to that of the Mediterranean littoral and the tropical islands of the Western Hemisphere. Unfortunately, the statistical material for comparison with high northern latitudes is very limited. Nova Scotia suffered in 1865 from a serious outbreak. In Canada the ratio from 1862 to 1869 was extremely low. Marked differences in the prevalence of the disease in stations approaching each other in climate and in the same stations in different years are noted—an observation in accord with our knowledge of the influence of local conditions, but not at all vitiating the importance of the general statement concerning the effect of climate upon the prevalence and intensity of the disease. It would appear that in tropical countries the access of enteric fever is more commonly marked by chill than with us; that the eruption is less common, not having been clearly distinguished by the author from insect bites, etc., in more than one-half the cases, about the proportion of reported cases generally; that splenic enlargement is less common than with us; that albuminuria is comparatively less frequent, and that the variations in the temperature curve are by far greater.

The author sums up an elaborate study of the collected facts as to the prevalence and introduction of the disease in the home and foreign stations, and an exhaustive inquiry into the predisposing influences, in these words :—

“Not only is the disease similar throughout the service, but the service disease is the same as the civil European; the military details give support to the civil deductions, and *vice versa*.”

The conclusion he reaches as to the exciting cause is :—

“That the specific theory more closely embraces the military data than any other, and is the only one that meets the requirements of the facts.”

The sections on pathology and treatment are well up to the times. They do not call for detailed consideration, for the reason that they embrace nothing that can be said to be peculiar to the military point of view. The author lays no stress upon a specific plan of treatment as such, a subject that bids fair to attract more attention in the future than it has yet done. He attaches to the subject of the disinfection of the clothing and excreta the importance it merits, and expresses a well-grounded disbelief in the efficacy of the measures commonly employed. Without being otherwise explicit, he suggests for this purpose the use of heat “to the boiling-point.” It would be better to make the heat greater for clothing, and to mix the stools with sawdust and burn them, an old method, which does not appear to have been brought to the notice of the author.

That which strikes us as by far the most important among the differences between enteric fever as we know it and enteric fever among British troops, is the difference in the death-rate. The former, from vast collections of cases by different observers, shows a mortality of 15 to 20 per cent., whilst the average proportion of deaths to cases in the latter is above 33.3 per cent. In some districts (foreign stations) the mortality reaches 50 per cent., and in a few localities—Mauritius, Ceylon, China, Bombay—it considerably exceeds the half of all cases (pp. 4, 117).

The author discusses many of the conditions to which this unfortunate result is due, incidentally, but with much force. So far as the scope of his book warrants, he also considers the subject of the prevalence of enteric fever in the civil populations at the various stations.

The book is a readable one, and widens the view of the subject of which it treats—a subject which is of sufficient importance to-day to give value to every well-considered contribution to its literature. J. C. W.

ART. XXXI.—*Epitome of Skin Diseases, with Formulæ for Students and Practitioners.* By the late TILBURY FOX, M.D., F.R.C.P., and by T. COLCOTT FOX, M.B., M.R.C.P. Third American Edition, revised and with additions. By T. COLCOTT FOX, B.A. (Cantab.), M.B. (Lond.), etc., 12mo. pp. 240. Philadelphia: Henry C. Lea's Son & Co., 1883.

THAT this little book should have reached a third American edition, in the face of competition from several native productions of a similar scope

is a strong testimony in favour of its practical and popular character. The late Tilbury Fox was a very forcible writer, and all that he wrote bore the impress of his personality, and carried the weight of his individual experience. In the present edition, Mr. Colcott Fox has, while preserving the unity of the work, made numerous minor changes, most of which add to the conciseness of the text, while they necessarily detract somewhat from its attractiveness of style. The pages on the pathology of skin affections have been omitted in this edition, and the description of the various primary and secondary lesions has been considerably condensed. The classification of the American Dermatological Association which has been interjected by the American editor, though excellent in itself, is incongruous, and the more so because quite different from that given by the authors a few pages previously.

The individual diseases are arranged in alphabetical order, a plan which we objected to in our notice of the last edition of this work, but to which we are now inclined to give our adhesion, because it is most convenient for hurried reference. A large number of affections find their place in the list for the first time in this edition, while numerous cross references facilitate the use of the book by one unaccustomed to the synonyms of dermatology. Among the diseases described for the first time in this edition we find *anæsthesia*, *angioma pigmentosum et atrophicum*, *anidrosis*, *bromidrosis*, *chromidrosis*, *dermatitis*, and *dermatolysis*. The name elephantiasis is confined to the connective tissue hypertrophy always known as *elephantiasis arabum*, while leprosy is very properly found under the title *lepra arabum*, thus avoiding the possibility of confusing two entirely different affections. Other affections described for the first time are *fragilitas crinium*, *frambæsia*, *gangrene of the skin*, *melanoderma*, *nævus*, *vaccinal eruptions*, and *verruca*. Some articles, as that on lichen in its various forms, and on the treatment of ringworm, have been considerably augmented, and in fact there is scarcely a page which has not felt the hand of the reviser. The generous reference to the work of others always so characteristic of the late Tilbury Fox, and which brought in the names of a very large number of those writers on dermatology, whose labours had been utilized, has not been continued in this edition—perhaps this was hardly possible in so small a book. The formulary at the end has been thoroughly revised and enlarged.

A. V. H.

ART. XXXII.—*The Principles and Practice of Medical Jurisprudence.*

By the late ALFRED SWAINE TAYLOR, M.D., F.R.S. Third Edition.

Edited by THOMAS STEVENSON, M.D. Lond. Two vols. 8vo., pp. xx., 727; xiv., 657. Philadelphia: Henry C. Lea's Son & Co., 1883.

DR. STEVENSON, as the successor of Dr. Taylor at Guy's Hospital, and officially recognized as an analyst of skill and experience, is the proper person to issue the larger work on legal medicine which his predecessor gave to the world.

For years Dr. Taylor was the highest authority in England, upon the subject to which he gave especial attention, correlatively his experience

was vast, his judgment excellent, and his skill beyond cavil. It is therefore well that the work of one who, as Dr. Stevenson says, had an "enormous grasp of all matters connected with the subject," should not be permitted to lapse into the list of old books, but be brought up to the present day and continued in its authoritative position.

To accomplish this result Dr. Stevenson has subjected the work to most careful editing, bringing it well up to the times. In doing this, the editor has found it necessary to condense some parts of the book and entirely rewrite others. By so doing he has been able to keep the work within its former limits, and at the same time to incorporate in it some of the more recent and important cases.

How well this has been done may be instanced by referring to the sad case in which Dr. Lamsen used aconitine for the destruction of his brother-in-law, of which the important details are given by Dr. Stevenson. A comparison of this with former editions will show that the number of cases has been increased, and that the work of a careful and conscientious editor is manifest in both volumes.

Excepting for the references to this JOURNAL there seems to us to be too little recognition of the work done in this country.

This treatise is certainly entitled to preserve the high rank it has attained, and will not be readily superseded as an authority in Great Britain, yet there would seem to be room for another work, treating the subject in a different way. As at present constructed, works on medical jurisprudence aim too much at making legal doctors, rather than medical experts. There is an array of legal knowledge with a citation of authorities and reported cases, which are both formidable and confusing to the average physician. At the same time, and to satisfy the exigencies of the construction of the book, the cases are too often given merely in abstract. In this way the interest which always attaches to detailed narrative is in great measure lost, while the multiplicity of references tends to leave only an indefinite impression upon the mind of the reader. We take it that the detailed narration of a comparatively small number of cases, and the mere reference to others by title either in foot-notes, or in an appendix, would make a most interesting and a most valuable contribution to medical literature. With such a selection of cases the principles which must guide the medical expert could be incorporated, and though it might not be available as a legal text-book, it would help to make its readers good observers and reliable medical detectives, which after all is the proper function of the medical expert. Such a detective will not trouble himself about legal points or precedents, but will aim at observing everything which will aid him in making a diagnosis of the case. He will approach each case, as he would one of intricate disease, and, after observing, formulate his diagnosis and be able to explain to any intelligent mind the steps by which he had arrived at his conclusion.

While we have thus ventured to express our opinions as to the need of another kind of book, we desire to add our testimony to that of others as to the value of this one, and to congratulate its editor upon the successful manner in which he has accomplished a delicate and difficult task.

S. A.

ART. XXXIII.—*Clinical Lectures on the Diseases of Women, delivered in Saint Bartholomew's Hospital.* By J. MATTHEWS DUNCAN, M.D., LL.D., F.R.S.E., President of the Obstetrical Society. Second edition, much enlarged, with appendices. 8vo. pp. 442. London: J. & A. Churchill, 1883.

IN this volume we are presented with a much more extensive range of subjects than in the first edition, which appeared in 1879, the number of lectures having been increased from nineteen to thirty-five, to which has been added an appendix containing seven short papers. This addition has been dedicated to Mr. Joseph Lister, of world-wide fame, the former having been inscribed with the name of Prof. Fordyce Barker, of New York.

Dr. Duncan, by his lectures and numerous contributions to medical science, has obtained a world-wide reputation as a teacher, close observer, and practitioner. Well read in his special branch, and having had a large experience, his writings are peculiarly practical in character, and illustrated by reports of cases which have been under his own care. His lectures have been largely read in this country, and his opinions are well known here: they have also appeared upon the Continent in Italian, German, and Russian.

Although by no means a complete treatise, the subjects have been well chosen, and are mainly medical in character, the object being to teach the diagnosis and treatment of the diseases of women, to be encountered in the daily practice of the physician, rather than of the surgeon-gynecologist. As a teacher, Dr. Duncan is very positive in his views, leaving nothing in doubt as to his position on a question at issue: in fact he has sometimes been thought to allow a pre-conceived prejudice to bias his opinion against a new method, as he is credited with, in regard to Emmett's operation for lacerated cervix uteri, which he has strongly opposed without a trial, although others of his countrymen having such a prejudice, have been convinced of their error after a careful investigation of its curative value. Aside from all this, the reputation of Dr. Duncan was established long before he left Edinburgh for London, and it was the position he then held before the world that procured him the chair he now so well fills, and elevated him, a stranger, to the presidency of the Obstetrical Society of London.

We shall hope to see at a future day a more general gynecological treatise, arranged in a different form, from the pen of Dr. Duncan; and in the mean time have only to recommend the volume under review as a valuable treatise for the library of the physician.

R. P. H.

ART. XXXIV.—*Elements of Surgical Pathology.* By AUGUSTUS J. PEPPER, M.S., M.B., F.R.C.S., etc. Illustrated. 16mo., pp. xii., 503. Philadelphia: Henry C. Lea's Son & Co.

THE author of this little hand-book tells us in his preface that his aim has been to supply what has long been felt as a desideratum, a small work

on surgical pathology suited to the requirements of students preparing for the final examinations. This undertaking, far from being an easy one, demands a degree of skill which is not the possession of every one who may have the inclination to make such an attempt. The subject is large, and it is hard to bring it within the compass of so small a book as the student can go over rapidly under the pressure of approaching examinations. In the matter of compression, however, the author of the book before us has done very well. But another feature of more importance than condensation in a text-book is reliability. The student preparing for examination ought to be given not only what he can quickly swallow, but also what he can readily digest and profitably assimilate. In these regards we do not think the author has done quite so well as in that first mentioned. Of course we are aware that a book of this sort is not the place for the discussion of mooted pathological questions, that the occasion calls for brevity and positive statement; and it may be the author could, if he had the space, defend the very opinions which least coincide with those of his critic. None the less is it the duty of a critic to indicate what may strike him as susceptible of improvement in the matter of any book that comes under his notice. The same may be said in relation to the form of a book. The author may think it so reasonable and so plain that one must be stupid not to find it easy to understand, while the critic may think very differently. Yet here again the critic must use his own judgment, not the author's, and take the responsibility of his own fallibility. In regard to the book before us, we may premise by saying we find much to commend in it. It is sufficiently clear and explicit in many respects, and manages to include a great variety of pathological conditions in its small space. Some of these are treated in a perfectly satisfactory way. But there are others the teaching in regard to which might be improved, and some about which the statements of the author appear to us quite erroneous. If we consider first the arrangement of this work, we do not see why "suppression of urine" should be put between "idiopathic pyæmia" and "erysipelas," and in the chapter on "septicæmia and pyæmia." Nor, again, why "tetanus" should come between "lupus" and "union of wounds." If we attend to the matter of the book we are stopped by the expression "micrococci, bacteria, etc.," which certainly would not lead the student to suppose that micrococci are a subdivision of bacteria. Again, we ask ourselves, is the author justified, in view of the form of pain in felon, in making the distinction that "aching" pain is "symptomatic of tension beneath very resisting structures"? And, is it true that throbbing pain depends on softening of the tissues and the allowance of "considerable latitude for expansion of the vessels"? Turning to the chapter on ulcers, we find that syphilitic ulcers are said to be of two kinds, "infective and non-infective, indurated and soft." This is not only contrary to fact—for, whether unicists or dualists, all syphilographers agree that every syphilitic sore is infective—but it is also contrary to what the author himself states in the chapter on syphilis, where he plants himself pretty squarely on the platform of dualism, and shows that he knows the difference between what is and what is not syphilis. Unfortunately, however, this chapter on syphilis is one of the worst examples of bad writing which his book affords, and hardly redeems him from judgment for the misstatement in a previous place, which might be set down to an inadvertence.

But we must not take up too much space in vindicating the intimation that the author has not all through his book furnished the student with pabulum of the most digestible and most nutritious sort. It strikes us

that, in certain places, his expressions indicate that he has no very great personal familiarity with the subjects of which he speaks. If this be true, we can understand—but not otherwise—why in regard to gonorrhœa he allows himself the timid expression: “Constitutional infection is the chief sign of a specific disease, and in the great majority of cases gonorrhœa is a purely local disorder.”

The chapter devoted to urinary deposits and calculi is most incomplete and unsatisfactory. It might do for a student who only needed a little hint, to be told that the “characters” of “carbonate” are “small and delicate crystalline spherules, drum-sticks.” But what would he do if he looked for the characteristics of uric acid, and could not find them, unless he chanced upon them as the “crystalline form” of “urates or lithates of ammonia and soda”? And how would he miss all mention of tube-casts! (An explanation of the author’s defects in this chapter is furnished by the foot-note in which we are informed that he has here borrowed from that other defective “grinder” for students, Keetley’s “Index of Surgery.”) In the chapter on the carcinomata, we find, after much that may be praised, and when we had hoped to escape the need for finding fault, the following sentence, which may be intelligible to the author, but which we find not quite clear: “Dr. Thin has shown that beneath the basement membrane of duct cancer there is a delicate feltwork of interlacing elastic fibres, similar to that described by Henle around the milk ducts of the breast.”

And thus we have reached the end of this book. With regret we have had to speak in no very laudatory terms of some of its features, yet it has merits which deserve that they should at some future time be delivered from the drawbacks which impair their usefulness. The general plan of the book is good, though the arrangement might be improved, and so might be the wording of many of the sentences; certain conditions might be treated of more fully, and others might be curtailed, without loss; but the excellent illustrations could hardly be bettered, the typography is very good, and the handy size and shape are to be commended. C. W. D.

ART. XXXV.—*The Treatment of Acute Rheumatism; An Analysis of the Results obtained under different Systems of Treatment in Saint George's Hospital during the years 1877 and 1878.* By ISAMBORD OWEN, M.D., Lecturer on Materia Medica and Therapeutics, etc. etc. Quarto, pp. 28; tables viii. London: J. & A. Churchill, 1883.

THIS thesis is an admirable example of the clinical method of investigating the value of remedies. It consists of an analysis of 210 attacks of acute or subacute rheumatism occurring during the course of two years in 202 patients, and treated by different methods in Saint George's Hospital. The cases were treated by the members of the staff, but the records were made by the author, as Medical Registrar, and under conditions favourable to uniformity of observation and accuracy of the results.

In 85 cases the primary attack was treated with sodium or ammonium salicylate, in doses amounting at first to *three drachms or more* for the adult in twenty-four hours. This amount was reduced as soon as the required effect was produced, or toxic symptoms appeared. In 49 of these

cases full doses of alkali (potassium bicarbonate or potassium citrate in sufficient amount to render the urine alkaline) were given along with the salicylate.

In 52 cases the salicylates were given in doses amounting at first to two drachms in twenty-four hours. These doses were reduced as occasion required. In 38 of these cases full doses of alkali were given along with the salicylates.

In 19 cases the salicylates were given in doses not exceeding one-and-a-half drachms in twenty-four hours. In all but four of this group full doses of alkali were combined with the salicylates.

In 29 cases the primary attack was treated by full doses of alkali, alone or in combination with quinine.

In 6 cases the drug used was potassium iodidi, alone or combined with the alkali, guaiacum, bark, or sarsaparilla.

In 19 cases the treatment originally adopted was changed for another before the termination of the primary attack.

The cases are classified with reference to the degree of pyrexia and the presence or absence of marked swelling or redness about the joints. Due consideration is given to the duration of the case before coming under treatment and to the length of the convalescence. For the author's ingenious method of presenting these cases in tabular form the brochure itself must be studied. The conclusions are of great practical importance. They are as follows :—

“The duration” (under treatment) “would appear to be independent, both of the character of the cases (as far as defined in the classification) and of their previous duration.”

“The primary attack, after the commencement of treatment, was about half as long under salicylate as under full doses of alkali.”

“In administering the salicylates, an advantage is gained, in shortening the total duration of the case, by restricting the initial doses, and by combining with them full doses of alkali.”

In respect of actual suffering, it appears that—

“All the modes of salicylate treatment show a marked advantage when compared with the results of alkaline treatment.”

“The advantage was least marked when the salicylate was given in large initial doses without alkali, and hardly more so when the salicylate was given in small doses.”

The best results were obtained in respect of suffering, as in respect of duration, by the combined alkaline and salicylate treatment.

The information afforded by these cases, as to the influence of the salicylates in cardiac complications, is slight.

No support is given to the view that permanent damage to the kidneys results from the use of the salicylates; but it is more than probable that transitory albuminuria during the febrile state is favoured by their employment.

Toxic effects were produced in 23.5 per cent. of the cases in which the salicylates were given in initial doses of three drachms or more in twenty-four hours; in 13.5 per cent. where the amount was two drachms, and in 10.5 per cent. where it did not exceed two-and-a-half drachms.

The most frequent symptoms of the poisonous effect were delirium and vomiting. Among the rarer manifestations were deafness and tinnitus aurium, mental excitement, tremor, shivering, giddiness, and papular and pustular rashes.

J. C. W.

ART. XXXVI.—*A Treatise on Syphilis in New-born Children and Infants at the Breast.* By P. DIDAY, Ex-surgeon to the Hospital de l'Antiquaille, Lyons. Translated by G. Whitley, M.D. *With Notes and an Appendix* by F. R. STURGIS, M.D., Professor of Venereal and Skin Diseases in the New York Post-Graduate School, etc. 8vo. pp. xii., 310. New York: William Wood & Co., 1883.

TWENTY-FIVE years ago the New Sydenham Society translated and published in England the excellent treatise of M. Diday on Infantile Syphilis. This year, this translation has been taken, and with the addition of certain brief notes, and a very short appendix by Dr. Sturgis, has been put out as a member of the "Library of Standard Medical Authors," with the title on the back "Hereditary Syphilis, Diday and Sturgis."

There is no need at this late day to make a review of the work of M. Diday. It has been long before the medical public, and has won the esteem of all students of syphilis, even though the views of the author have not all stood the test of time and further investigation. The work is truly a classic, and no one ought to attempt to treat the subject without learning what is in it. Unfortunately for those who cannot read French, it was published in England as one of a set of books, and it is not always easy to lay one's hands on a single number of these. The same misfortune attaches to this present republication. It is one of a set, and single numbers are not on sale.

The volume before us has all of the merits of the English translation, and is somewhat improved by the brief notes and meagre appendix which Dr. Sturgis has contributed. The improvement, however, is not sufficient to prevent a feeling of regret that when the profession was given a reprint of the New Sydenham Society's book, it was not given just as it was, and that Dr. Sturgis has not carried out his original intention to write a work of his own on this subject.

C. W. D.

ART. XXXVII.—*Experimental Pharmacology. A Handbook of Methods for Studying the Physiological Action of Drugs.* By L. HERMANN, Professor of Physiology in the University of Zurich. Translated with the author's permission, with notes and additions, by Robert Meade Smith, M.D., Demonstrator of Physiology in the University of Pennsylvania. Pp. 201. Philadelphia: Henry C. Lea's Son & Co., 1883.

THE study of pharmacology, that is, the application of the exact methods of physiology to the investigation of the effects of drugs upon the animal economy, has proved of double value, inasmuch as it has on the one hand explained the actions of these drugs on the body—its prime object—while secondarily it has thrown much light on the physiological phenomena incidental to its prosecution. It is a study too in which very accurate results may in many cases be obtained, and as its directly practical bearings are often plainly visible, it is that branch of physiology which in this country has perhaps met with more favour than any other.

Prof. Hermann's handbook, which Dr. Smith has translated and enriched by many valuable additions, will therefore be gladly welcomed by those engaged in this department of physiology. It is an excellent little

book, full of concise information, and should find a place in every laboratory. It explains the various methods and instruments used, and points out what lines of investigation are to be pursued for studying different phenomena, and also how and what to particularly observe. It is divided into two parts. In the first the study of the action of poisons upon isolated organs is considered, while in the second their general action is treated of. The book is enriched with many illustrations taken for the most part from the larger works of Cyon, Sanderson, and Foster.

W. M.

ART. XXXVIII.—*The Diseases of Women; a Manual for Physicians and Students.* By HEINRICH FRITSCH, M.D., Professor of Gynæcology and Obstetrics at the University of Halle. Translated by Isadore Furst. 8vo., pp. vi. 355. New York: William Wood & Co., 1883.

IN Fritsch's Manual in its present form the English reader has the advantage of an excellent and concise statement of the subject upon which it treats from the German standpoint. It is particularly good in the manipulative part, and if there are any differences between an American or English and a German manual upon Gynæcology, it lies in this direction. Manipulations are clearly described, and, considering the form of the reprint, well illustrated. The author is surrendered to the germ theory, and throughout the book antiseptics dominates every procedure. No one can find fault with this, as antiseptics is but another name for clean surgery, nor should one expect in a treatise of this character to find disputed subjects alluded to at any length; but moderation is a virtue as well as cleanliness, and it would have been as well to let the reader have some hope for success in gynæcological operations beyond the boundaries of Listerism. It is a fair sample of the author's extreme position to quote a sentence. In preparing a patient for a laparotomy, after a series of disinfecting baths, he says that he has thought himself "justified in giving besides evacuants also disinfecting internal remedies." The translator's word "remedies" may not exactly give the meaning of the original, but it is near enough to show the author's idea of what are termed antiseptic precautions. We welcome the book for the single reason that methods are taught free from the defects of prejudice that do so much to impair the value of some of our best native hand-books, and thus will diffuse a broader and more healthy feeling upon points that in this country are in debate. The very absence of individuality in the author's style will still more contribute to this end. A few things are noted that may be dissented from, but not in important matters. For instance, to the student it cannot be a very important matter that Trenholm instead of Battey is mentioned in connection with castration, nor would it be mentioned in this notice except that it shows that even the most liberal author may have, in fact nearly always has, here and there in half-concealed nooks bits of feeling that will crop out. Of course Fritsch knows as well as we do ourselves the history of this operation.

It is unnecessary to follow the author through the book, as the arrangement is purely conventional, diseases of the pelvic organs, with their pathology, causes, symptoms, and treatment, following to the close of the volume, after the first five chapters of general introductory matter, which are the most interesting parts. The Manual is one worthy of the author and translator, and speaks well for the good judgment of the publishers.

E. V. DE W.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Innervation of the Cardiac Portion of the Stomach by the Pneumogastric.

Dr. Theodor von Openchowski, of Kieff, gives the following as the conclusions drawn by Professor H. KRONEKER on this subject: 1. The cardia of rabbits is innervated by the pneumogastric, the right sending a branch to the anterior part of the œsophagus, the left to the posterior part, branches being also sent to Auerbach's plexus in the stomach; this plexus also receives sympathetic filaments from the mesenteric ganglia. 2. From Auerbach's plexus, which contains multipolar ganglia, net-like fibres are distributed to the muscular structure of the stomach and cardia, so that the plexus is an intermediate centre in relation with which are the vagal respiratory sympathetic centripetal fibres, which represent centrifugal tracts to the muscular structure. 3. The pneumogastrics also send small fibres to the small collections of sympathetic ganglia which are dispersed over the cardia. 4. Attached to the larger branches of the pneumogastric, lying in the cardial region, are large many-celled (some containing so many as twenty cells) ganglia. Eight such groups were found attached to the right vagus, and three large collections to the left.

This anatomical distribution becomes intelligible through the following physiological facts: 1. The divided cardia (of frogs) can perform automatic contractions for hours. 2. In living rabbits the unirritated cardia remains at rest; after death, as is well known, it makes rhythmical contractions (cardial pulse). These contractions can be observed on the living animal if the cardia is rendered anæmic by ligating the cœliac artery. 3. The cardia cannot be made to contract by isolated induction blows, by which the vagus is irritated. 4. Strong induction blows, at intervals of one-third of a second, cause feeble contractions of the cardia after from one-half to two seconds. 5. Frequent irritations, of moderate intensity, at intervals of one-twelfth to one-thirtieth of a second, cause contractions; of slight intensity cause expansion of the cardia. 6. Frequent irritations of considerable intensity (intervals of one-fiftieth to one-sixtieth of a second) cause also feeble expansion of the cardia. 7. Irritations, sufficient to cause opening of the cardia, often do not give any evidence of vagal action in the registered heart beats. 8. It is necessary to recognize that the cardia, under the conditions of the experiment, is generally found in a condition of considerable tonus, which can

be decreased by retarded innervation. 9. This retardation can be obtained by electric tetanization of the vagi, by accelerating respiration, or by local venous engorgement (constricting the portal vein). 10. Such contractions are stronger after section of the vagi in the neck, and do not cease when the splanchnics are divided in the abdomen. 11. If all the vagal branches which do not directly supply the cardia, are divided, one obtains, through electrical stimulation of the vagi by a power current, a strong expansion of the cardia, this decreasing excitability lasting a long time. 12. If one succeeds in destroying the cardial fibres, while the fibres of the stomach are left intact, irritation of the vagi will produce closure of the cardia with every strong current. This function is easily exhausted, but soon returns to its former state. In this way special constrictor nerves of the cardia are recognized. 13. After interrupting all sympathetic connections between the abdominal ganglia and the stomach the above phenomena remain unaltered.—*Centralb. f. die med. Wissensch.*, Aug. 4, 1883.

Uterine Milk.

A recent number of the *Zeitschrift für Geburtshülfe und Gynäkologie* contains an article by Dr. G. VON HOFFMANN, of Wiesbaden, in support of the doctrine advocated by Ercolani, and to a certain extent by Dr. Braxton Hicks, viz., that the fœtal villi in the placenta do not float naked in the maternal blood, but are surrounded by cells whose function it is to secrete a special fluid serving for the nutrition of the fœtus, and called uterine milk. Dr. von Hoffmann believes that he has been able to extract this fluid from the human placenta. His method is simply this—he takes a quite fresh placenta, which has not been allowed to come into contact with water, and lays it with its maternal side uppermost. A cotyledon, the integrity of which has not been damaged, is then selected, and carefully dried with a sponge or towel, so that no blood adheres to it, and into a capillary tube is then pressed, so that it may penetrate about one third or half an inch. The tube thus used pushes the villi aside, and lies in the inter-villal space. It is important in inserting the instrument to see that no bloodvessels are injured by it, lest blood be effused between the villi. When a capillary tube is employed in this manner it sucks up the fluid from the inter-villal space (*i. e.*, the uterine milk), which can then be collected and examined. Dr. von Hoffmann has examined the fluid from about forty placenta, some at term, others from cases of absorption at different months. Microscopically, he finds in it the following constituents: 1. Red blood-corpuscles of different sizes and depth of colour, often, especially in placenta of the earlier months, with little or no tendency to aggregate into rouleaux. 2. White corpuscles. 3. The chief structures contained are what the author calls “uterine milk-globules,” peculiar, clear, round globules, having a very thin, feebly refracting wall, on the average about as large as white corpuscles, but varying from a tenth of, to twice, their size. These bodies precisely resemble those seen in “uterine milk” obtained from the placenta of the cow. 4. Clear watery intercellular fluid. The above-described “uterine milk-globules” are present in such numbers that Dr. von Hoffmann calculates that each cubic millimeter of the fluid contains 180,000 to 200,000 of them. 5. There are also found free decidual cells and pigmentary molecules, granules, and flakes of different shapes and sizes, which our author regards as products of the disintegration of red blood-corpuscles. Fluid such as this, Dr. von Hoffmann states, can be extracted from every healthy placenta; if it is wanting, the placenta is not healthy. He believes, moreover, that he has traced the mode of formation of these “uterine milk globules” from decidual cells, and the production of the large decidual cells from the many nucleated “giant-cells” of the decidua.

Dr. von Hoffmann's views as to the physiology of fetal nutrition are summed up in the following propositions: 1. The general office of the decidua, both in animals and in man, is to supply the fœtus during its intra-uterine life with a part of the nutritive material necessary for its growth. To fulfil this function the decidua serotina becomes a special milk-secreting organ, which, after the birth of the child, is expelled with, and as an integral part of, the placenta. 2. The secretion of this organ, the so-called uterine milk, is separated into gradually formed spaces, in which lie the placental tufts. Here the uterine milk is mixed with maternal blood, which is at the same time extravasated, and together with it forms the material for nutrition of the fœtus, this material being only suited for absorption by the placental villi when these changes have taken place. 3. From the point of view of the comparative anatomist, it can no longer be maintained that there is any essential difference in this respect between the placenta of man and the higher animals. Dr. von Hoffmann promises a further communication in which he will elucidate the mode in which this uterine milk is absorbed by the placental tufts.—*Med. Times and Gazette*, Nov. 24, 1883.

MATERIA MEDICA AND THERAPEUTICS.

Cotoin and Paracotoin.

Cotoin and paracotoin are two but little-known medicinal agents to which Albertoni has recently given some fresh attention (*Archiv für exp. Path. und Pharmac.*, Sept. 1883). Eight years ago the bark called coto-coto was first brought to England from Bolivia. Of its origin nothing further is known. Two kinds of bark are described, coto verum and paracoto. The chemical composition of cotoin is represented by the formula $C_{22}H_{18}O_6$, which is the active constituent of coto verum. According to Burkart, the subcutaneous injection of one gramme of cotoin into rabbits gives rise to no effect. Pribram believes that this substance possesses antiseptic properties, and he has recommended its use in small doses for some cases of diarrhœa in children. Albertoni finds that repeated small doses increase the appetite of healthy men without causing unpleasant sensations and without producing constipation. Subcutaneous and intravenous injections of alkaline solutions of cotoin performed on rabbits and dogs were followed by no remarkable phenomena. No influence is exerted by this agent on the process of digestion. It does not become dissolved in the gastric juice, but passes unchanged into the intestines. There can be no doubt that the principle is absorbed and excreted by the urine, as Albertoni proved on himself. The characteristic secretions of cotoin consist in the appearance of yellow coloration with alkalies, red tint with nitric acid, and brown-golden with sulphuric acid. Investigations were also made to determine the influence which cotoin might exert on the process of decomposition, either in the intestines or outside the body. Taking the excretion of indol as the guide, it was discovered that during the administration of the drug phenol did not disappear from the urine. Nevertheless, Burkart and Pribram are right when they assert that in cases of diarrhœa under the medicinal use of cotoin the indican in the urine falls off. But Albertoni contends this is a secondary effect which depends on the cure of the intestinal lesion. From other artificial experiments the conclusion is arrived at that cotoin is not able to hinder putrefaction in the development of bacteria either in or outside the animal organism. Injections of solutions of cotoin into

the jugular veins and other experiments went to show that cotoin could determine an active dilatation of the vessels of the abdomen. No other substance has yet been shown to possess a similar action on the vessels of the peritoneum and of the intestines. Salvioli found by the artificial circulation of opium tincture that the quantity of blood flowing through the intestines was increased. Mosso has told us that chloral exercises a similar effect on the renal circulation. The vascular dilatation appears to be due to a paralysis of the muscular coat in the last two instances. As a matter of fact, opium and chloral lower the blood pressure, and after some time the circulation may cease. Paracotoin is a weaker cotoin in its physiological action. Therapeutically cotoin was found to be of value by Albertoni in cases of diarrhoea met with in the various forms of mental disease in chronic intestinal catarrh, in looseness of cachectic states, in the relaxation of pelagra, phthisis, and rickets. Cotoin is contraindicated in states of severe hyperæmia of the intestines, and where a tendency to melæna exists. Larger doses (from fifteen to twenty centigrammes per diem) were thought to be of more efficacy than smaller ones. The powder in capsules or emulsion, with gum, etc., may be ordered, or a solution in carbonate of soda with water and glycerin. Frommüller thought that the colliquative sweating of consumptives was relieved by the drug. Paracotoin acts pretty much in the same way as cotoin. The combination of magistery of bismuth with cotoin, it is suggested, will be found to be of special value.—*Lancet*, Oct. 20, 1883.

Investigations into the Action of the Digitalis-Group.

At a meeting of the Royal Medical and Chirurgical Society on November 27, Dr. SIDNEY RINGER read a paper on this subject. Digitalis was taken as the type of a group of drugs whose influence was exerted mainly on the circulatory system. The facts of chief importance in this action were: 1. the arrest of the heart in systole (if the dose were sufficiently large); 2. the raised blood-pressure which obtained throughout till close upon the final systolic arrest. Whilst the spasm of the heart was universally recognized as the result of the digitalis-action, and as caused by direct action of the drug on the cardiac tissue, there was doubt both as to the condition of the arterioles under the influence of the drug, and as to whether the influence was direct or indirect. The action of digitalis upon the heart might be thus defined: as the production of continuous spasm of the heart-muscle by direct action of the drug on this tissue. It was pointed out that this spasm could not be of the nature of a tetanus, *i. e.*, of a fusion of adjacent beats, and, further, that it might affect either the whole heart or a limited portion of the same, according as the drug was applied to the whole heart or to a limited portion. Thus defined, the already very large group of bodies classed by Schmiedeberg under the heading digitalis became yet larger, and would include, amongst others, the caustic alkalies and barium salts. Experiments were recorded in which an artificial saline solution was circulated through the vessels of the hinder extremities of a tortoise whose brain and spinal cord had been completely destroyed. The experiments were so arranged that the rate of flow could be measured; and so soon as a uniform rate of flow had been established, the drug was added to the circulating fluid. The results obtained with digitalis were both uniform and striking; invariably, on the addition of the drug, the circulation became slower, even to the extent of almost complete stasis. Similar experiments were made with the following members of the digitalis group: strophanthus, dyak poison, convallamarin, and scillitine. In the case of each of these drugs, evidence of constriction of the vessels was obtained, in the shape of a slowed circulation-rate. Digitaline, however, ranked as by far the most active

of the above. Similar experiments were made with hydrate of potassium, and with the carbonates of potassium, and sodium bicarbonate, which, with the exception of the last, gave like evidence of constriction of the arterioles.

Experiments carried on simultaneously with the above, on the excised heart of a frog, showed, in the case of each of the above drugs, the production of more or less persistent spasm, with the notable exception, however, of sodium bicarbonate, which gave none. Experiments then followed which sought to determine whether the calibre of the vessels, in addition to being directly influenced by these drugs, could be affected by them through the nerves. Digitaline was alone experimented with. The results were purely negative. Finally, to meet the suggestion as to the action of the drugs on the skeletal muscles, experiments were made with frogs, given quantities of solutions of digitaline, strophanthus, dyak, scillitine, barium chloride, and caustic potash and soda being injected. The results showed the first five to be notable muscle-poisons, the muscles rapidly dying and losing their excitability; indeed, even before the death of the animal a very marked diminution of muscular irritability was in several cases observed. Comparing the actions among each other, it was noted that strophanthus and dyak poisons acted much more powerfully on the skeletal muscles than did digitaline.

To sum up, the argument, briefly stated, was as follows: Starting from the systolic digitalis-heart, which was admittedly a result of direct action of the drug on the cardiac muscle, the following conclusions were arrived at: 1. For the other members of the digitalis group here examined, a like action obtained. 2. It was suggested that the local action on the heart might serve as the definition of the action of digitalis; this accepted, Schmiedeberg's already large group must be still further enlarged. 3. Arguing from this action on the muscular tissue of the heart, it was inferred that the action on the muscular tissue of the arterioles would be similar—an inference verified by actual experiment. 4. So far as the experiments went, it was not found that these drugs influenced the calibre of the vessels indirectly through the nervous system. 5. It was pointed out that many of the digitalis-group were notable muscle-poisons, and that the tissue of the heart, standing functionally midway between the striped and unstriped muscular tissues, might permit of the inference that a marked action of the drug on the tone of the heart would indicate a similar effect on the tone of the vessels, whereas a marked action on the cardiac beat would indicate like action on the skeletal muscles.

Dr. LAUDER BRUNTON said he should feel that he was showing best his high value of the paper by pointing out first in what points he was in disagreement with its results. The definition of the digitalis-group was, he thought, too wide. It was a group so large, as to remind him of the two chemical groups of substances which were and were not precipitated by sulphuretted hydrogen. He had himself been engaged in some experiments on the group of substances which stopped the circulation by contracting the arterioles, and found that there were to be included in it many substances, such as cobalt, strontium, nickel, magnesium, and platinum, which were not generally recognized as having this effect. Their influence, however, he admitted, was much less than that of digitalis. His experiments had been carried out on frogs, in which the nerves had been destroyed. The amount of flow through the vessels was estimated by the drops, as they issued from the circulation, falling upon a delicately adjusted lever, and registering their fall by breaking an electric circuit, a method which he had found to work very satisfactorily. In the consideration of digitalis, he thought it important to consider it as a whole in its effects on the heart, the nervous system, the vessels; and, when considered in this way, a smaller group of analogues could be formed, as

Schmiedeberg had shown, from which even veratria must be excluded, in spite of its similar action in many points. In their action on voluntary muscle-fibre, the members of this group showed very different results, varying not only with different species of animals, but also with different individuals of the same species. One frog differed from another in susceptibility, and one cat from another. The causes of this difference he was at present endeavouring to ascertain. That digitalis was not a masked muscular poison, he considered as fairly well established, though even here the results obtained on *rana esculenta* differed entirely from those on *rana temporaria*, as he had had an opportunity of showing about fourteen years ago. The effects of caffeine also differed remarkably in these two species of frogs. The most interesting point in the paper had been the inference, from the action of digitalis on the heart-muscle, that it would have the same effect on the muscles of the vessels, and the confirmation of this, to some extent experimentally, which Dr. Ringer and Dr. Sainsbury had brought forward. It was probable, *à priori*, that the action on the two should be similar, since both heart and vessels were developed originally from a single tube, but it was an inference to be used with caution. That digitalis does contract the arterioles he considered as proved, though it was not universally accepted; some experiments of his own, along with Meyer, in 1867, had shown it, and fresh proof had now been brought forward by Dr. Ringer.—*Brit. Med. Journ.*, Dec. 1, 1883.

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Narcosis by Chloroform, by Ether, and by Nitrous Oxide.

NEUDORFER (*Deutsche Zeitschrift für Chir.*, Bd. xviii.) investigates the above, and comes to some highly important conclusions, which may be thus summarized: 1. Air cannot hold more than 20 per cent. of its bulk of chloroform-vapours at the ordinary temperature and pressure. 2. Chloroform acts as a poison upon the red blood-corpuscles, but only slowly, even upon corpuscles at rest, whilst those circulating through the lungs are not long enough under its influence to be destroyed. 3. It has been found by Bernard, Gréhaut, Hoppe-Seyler, and Hermann, that hæmoglobin has a greater affinity for carbon monoxide than for oxygen, and for nitrous oxide than for carbon monoxide. In other words, in presence of an excess of carbonic oxide the blood cannot absorb oxygen, and in presence of an excess of nitrous oxide the blood cannot take up either carbonic oxide or oxygen. Hoppe-Seyler and Gréhaut think that if the weakest of these gases (in their affinity for hæmoglobin) be previously present in excess, it hinders absorption of the gases of stronger affinity. As to this, the authors think that it does not hinder this absorption, but that the latter are thus rendered innocuous, and also that the affinity of hæmoglobin for oxygen is not constant, but varies within certain limits. 4. If to an individual whose hæmoglobin has a relatively weak affinity for oxygen we give to narcosis a mixture of 20 volumes of chloroform-vapour to every 80 volumes of air, he breathes a mixture holding 16 per cent. of oxygen instead of the usual 20 per cent. in the air, and it may happen that he may take up little or no oxygen, and the chloroform may exert its fatal effect. This is a simple and sustained method of explaining death by chloroform. 5. Now, arguing by analogy, since the very poisonous carbonic oxide can be rendered innocuous by the previous presence of other gases in excess, it is to be presumed that in a mixture of chloroform-vapour and oxygen, the chloroform could not exert its evil effects upon the blood-corpuscles. 6. There would be no danger of oxygen-poisoning, for the quantity given would be within the limits of the variations of oxygen taken up in nasal respiration. 7. The bad after-effects of chloroform would be done away with. 8. Twenty per cent. of chloroform-vapour would be unnecessary, since three to five per cent.

are quite enough. 9. As to ether it can be mixed up with oxygen up to 43 per cent., but it cannot compete with chloroform, because it possesses no constant chemical constitution, and its behaviour to human tissues is more prejudicial than that of chloroform. 10. The mixture of nitrous oxide and oxygen acts equally as well as the chloroform and oxygen mixture. 11. Oxygen is easily administered by Limousin's apparatus. 12. Narcosis thus caused is absolutely devoid of danger.—*British Medical Journal*, Dec. 1, 1883.

Action of Cantharides on the Kidneys.

Dr. IDA ELIASCHOFF gives the results of experimental researches on animals with a view to determining the action of cantharides on the kidneys.

The changes found in the kidneys involve the glomeruli and uriniferous tubules. At first there are the characteristic appearances of glomerular nephritis. Whilst the urinary secretion is diminished or completely checked, there appears an albuminous exudation which coagulates on boiling; this is colourless, and contains a few red blood-corpuscles. There is never any certainty that colourless corpuscles have wandered out into the stroma of the kidney; only in the neighbourhood of the medullary papillæ were cells collected in the collecting tubes, which could be considered as wandered leucocytes. The changes of the uriniferous tubules are confined to the glomeruli which resemble those in the collecting tubes of the cortex, in the collecting tubes and ascending loops. They consist in the degeneration of the inner half of the epithelium, which either undergoes direct desquamation or suffers a granular degeneration. Many nuclei are lost and fall into the lumen of the tube; the peripheral part of the epithelium, together with the rest of the nuclei, remains as a small continuous layer in the basement membrane. Of these tubes the ascending loops are the most resisting, changing later than the others. The collecting tubes of the medullary substance undergo simple epithelial desquamation. Eliaschoff has seen fibrin cylinders only once in the medullary substance, because death usually takes place too soon for their formation; but there is scarcely a doubt that loosened granular nuclei containing protoplasmic masses are formed later into cylinders in the tubules of the cortex.

Not without interest is the effusion of an albuminous exudation into the cavity of the glomerulus in marked diminution of the watery secretion. The explanation of this must be sought in some trouble of the vascular walls. In the epithelium of the glomerular capillaries no changes could be found. The changes in the uriniferous tubules depend upon the action of cantharides upon the epithelium. But what is this action? Is the cantharides eliminated by the epithelium, and by its passage through the epithelial cells came these changes, or do the glomeruli eliminate it, and the action take place upon the epithelial lining during its passage through the tube? Eliaschoff believes that the drug acts, at least in part, upon the glomeruli. The changes found in the tubes and in the renal epithelium must be attributed to the direct action of cantharides on the epithelial cells. With this knowledge, says Eliaschoff, we must be content for the present.

The first effect of cantharides comes on in about one-half an hour; wandered leucocytes are found, and the exudation of an albumen-containing fluid takes place. Here is to be sought the cause of the diminished urinary secretion. Later, after two or three hours, the uriniferous tubules are affected; the changes are very marked, and may all be attributed to the flowing of the cantharides down the lumen of the tubes.

The changes in the bladder can all be equally attributed to the action of the drug on the vesical mucous membrane. Twenty minutes after venous injection of a sulphindigotate of soda infusion the bladder was found empty and con-

tracted. The kidneys were tolerably blue, and showed, on section, colouring only in the cortex. The boundary line between the cortex and medullary substance, and the medullary substance itself, were of normal colour. Microscopical examination showed that the colouring matter was found only in the injured tubules of the cortex, either in the epithelium itself or in the lumen of the tubules. The colour, however, was much less marked than is the case in the normal kidney.

After half an hour the bladder contained a small quantity of bluish urine, corresponding with which section of the kidney showed a more or less intense coloration of the cortex, and a blue colour of the boundary—and medullary substance. On microscopic examination the colouring matter could be found not only in the injured tubules, but also in the lumen of Henle's loops. Besides, the glomeruli were here either of a diffuse pale colour, or contained the colouring matter in the form of nuclei or deposits; generally between the loops, here and there also between the capsule and vascular convolutions. The kidney examined after one hour had the same appearance as that examined at the end of half an hour, the colouring being confined to the cortex. In both kidneys the coloration was less marked than in the kidney examined at the end of twenty minutes; that is, a greater number of tubules had a slight diffuse colour. After two hours the colouring was still less marked. These experiments showed that the greater the interval between the administration of the cantharides and the sulphindigotate of soda the less colouring matter will be eliminated by the injured tubules.

The difference between cantharides and chromic-acid poisoning can be stated in a few words: In both forms there are changes in the glomeruli and uriniferous tubules. Kabiersky first recognized a wandering of leucocytes as well as blood-corpuscles into the capsule, so that the convolutions seemed to be affected. But this appeared to occur in later stages. Here the changes in the uriniferous tubules are prominent. Here, also, the injured tubules first became affected, and later, the ascending loops to a slight degree. But the epithelium is entirely necrotic, and cylinders are formed, whilst with cantharides there is a breaking up and degeneration of the epithelium, and a peripheric nuclei-containing border remains. In chromic-acid poisoning, therefore, it is clear that the hurtful substance is eliminated by the epithelium, and destroys it while passing through. In cantharides poisoning, on the other hand, the drug acts upon the epithelium whilst in the lumen of the tubules.—*Virchow's Archiv*; Bd. xciv. Hft 2.

The Physiological Properties of Maltose.

Until within the last few years the study of the digestion of starchy matters was carried on as though salival and pancreatic diastase, in acting on these substances, produced, besides dextrine, a sugar identical with glucose. Dubrunfaut, in 1847, had already announced that the sugar resulting from the action of malt on starch differed essentially from glucose by its optic properties. It was then proposed to call this sugar *maltose*. This assertion was only accepted when O'Sullivan, and after him Schulze, and then Musculus and Grüber, has shown that it was correct.

It is now well established that this sugar belongs, not to the class of glucoses, but to that of the saccharoses. This sugar is produced, as was shown by Musculus and de Mering, when saliva or pancreatic juice was used in place of malt. The study of digestion of starch matters is, therefore, not completed, when it is known that it consists in the transformation of these materials into dextrine and sugar. It still remains to be determined if dextrine and maltose, once formed, pass immediately into the blood, and are there directly utilized, or whether they must be broken up and transformed into glucose. M. BOURQUELOT now asks if there exists in the digestive juices a ferment capable of causing such a breaking up of

maltose; a point already partly examined by de Mering, Brown, and Héron. He finds that saliva, neutralized gastric juice, intestinal juice, invertine, and saliva and invertine combined, have no action on maltose, not more, except the last two, than on saccharose. When the intestinal juice has not been filtered through the apparatus it breaks up the two sugars.

M. Bourquelot concludes: 1. The small intestine is not the exclusive seat of saccharose digestion, and the precipitated acids may be considered as the important factors of the conversion. 2. Maltose, on the contrary, cannot be broken up in the intestine. 3. If the intestinal reduction of the two sugars is due to fermentation, it is different from invertine, which does not act on maltose.—*Revue Scientifique*, Nov. 10, 1883.

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Artificial Inflation of the Large Intestine as a Diagnostic and Therapeutic Measure.

The whole large intestine can be fully dilated by injections of solutions of bicarbonate of soda and an acid, thus causing the development of carbonic acid gas. The procedure, as recommended by Professor von ZIEMSEN, is as follows: A rectal tube, about six inches long, is carried into the anus, and fixed by pressing together the nates, the patient lying on the back. A funnel is then connected with the rectal tube by means of rubber tubing. For complete inflation of the large intestine, 3v of bicarbonate of soda, and 3ivss of tartaric acid are separately dissolved in water, and portions of either solutions alternately added. This is preferable to introducing the whole of the solutions at once, as the sudden distension of the intestine by the large volume of gas will cause a good deal of pain. Hence it is better to have intervals of several minutes between the additions of the solutions. Lest the gas should be developed in the rectal tube, the soda solution should be washed into the intestine by a little pure water.

Professor von Ziemssen claims that this method is very valuable as a diagnostic means, enabling the operator to judge definitely as to the position, form, and dilatability of the large intestine, the degree of occlusion of the ileo-cæcal valve for gases, the communication of the colon or rectum with neighbouring organs, as the stomach, small intestine, or bladder, or with the external surface of the body; also as to narrowing or occlusion of the intestinal canal, and under certain circumstances, also, as to the nature of an obstruction to the passage of feces. A very important use of this method is to diagnosticate the position of contractions, stricture, or occlusion of the intestine in cases in which it is desirable to operate, and also as showing the positions of peritoneal adhesions. Several cases are recorded in which a correct diagnosis was arrived at by this method, some being verified by post-mortem examination. As a rule, the small intestine is completely closed to the entrance of substances from the colon by the ileo-cæcal valve; under the influence of deep chloroform narcosis, however, this resistance is lessened, and fluids can be thrown into the small intestine.

As regards the therapeutic application of intestinal inflation, it may be used to cause evacuation of the bowels; carbonic acid gas being a prompt promoter of intestinal peristalsis. When used for this purpose, about one-half the above quantity of the reagents is sufficient. In cases of suspected ileus or intestinal obstruction, the bowel can be inflated whilst the patient is anesthetized.

Contraindications.—Theoretically, artificial inflation is contraindicated in affections in which there is diminished resisting power of the intestinal walls, but practically this contraindication exists only in typhoid fever and intestinal tuberculosis.

In other cases of ulceration and carcinomatous disease of the intestines, von Ziemssen has met with no bad results from its use. It is also, theoretically,

contraindicated after diffuse or circumscribed peritonitis, and especially after perimetritis and perityphlitis, on account of the danger of tearing adhesions and thickenings of the serous membrane, but practically this is not to be dreaded. The rupture of adhesions by gas inflation often causes tolerably intense pain, but does not cause inflammation; and on that account repeated inflation is useful in removing the after-effects of perityphlitis and periproctitis.—*Deutsch. Archiv für klin. Med.*, Bd. xxxiii., Hft iii. and iv.

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Solubility of Uric Acid in Saline Solutions.

M. JAHNS, of Göttingen, in an article on this subject, regards it of importance that the physician should know the influence exerted by the different salts, and particularly by the alkaline carbonates on the solubility of uric acid. The determination of this solubility has engaged the attention of chemists for some time. Liebig recommended phosphate of sodium to dissolve uric acid, and Wetzler has used borax for the same purpose. Lipowitz first noticed the powerful solvent action of carbonate of lithium on uric acid, and showed that it was superior to the carbonates of potash or soda, the acetate of potash, borax, or sodium phosphate.

Binswanger has determined the solubility of uric acid at blood temperature. His experiments were made with grs. iv of the salt in f $\bar{3}$ j of water; for the carbonate of soda f $\bar{3}$ j of water were used. His results were as follows:—

Grs. iv of borax . . .	dissolved grs. ijss of uric acid.
“ “ sodium phosphate “	j $\frac{1}{4}$ “ “
“ “ carbonate of lithium “	xv “ “
“ “ sodium carbonate “	ij $\frac{3}{4}$ “ “
“ “ sodium bicarbonate “	ij “ “
“ “ borate of potash “	ijss “ “
“ “ borate of ammonium “	$\frac{3}{4}$ “ “
“ “ boric acid . . . “	$\frac{1}{7}$ “ “
f $\bar{3}$ j of water	τ $\frac{1}{10}$ “ “

Becker has recommended birocitrate of magnesium, and a mixture of borax and sal ammoniac as solvents of uric acid. Madsen has given a formula for the preparation of birocitrate of sodium and magnesium, and states that it exercises a superior solvent action on uric acid to benzoate of lithium. In the following experiments a definite weight of pure uric acid, dried at 100° C., was frequently shaken for eight hours in a saline solution at a temperature of 38° to 40° C., the undissolved acid was then collected on a filter, washed with a definite quantity of water, dried at 100° C., and then weighed. The salt was dissolved in 200 c. c. in quantities of grms. .4 to .45, avoiding the deposit of acid urates. Under these conditions, the mean of five experiments showed that grm. 0.0214 of uric acid was dissolved in 200 c. c. of water. After deducting this weight from the quantity dissolved by 200 c. c. of the saline solutions, the results were as follows:—

1 part of carbonate of lithium . .	dissolves 3.51 parts of uric acid.
1 “ benzoate “ . .	0.026 “ “
1 “ chloride “ . .	0. “ “
1 “ carbonate of sodium (+10 H ₂ O) “	0.98 “ “
1 “ phosphate “ (+12 H ₂ O) “	1.25 “ “
1 “ borax (+10 H ₂ O) “	0.83 “ “
1 “ sulphate of sodium (+10 H ₂ O) “	0. “ “
1 “ chloride “ “	0. “ “
1 “ birocitrate of magnesium . . “	0.099 “ “
1 “ “ (Madsen) “	0.093 “ “

To obtain the total solubility, it is necessary to add to these numbers grm. 0.0214 of uric acid.

Jahns, in experimenting at 38° to 40° C. with fourteen specimens of continental mineral waters, found that Vichy (Grande Grille) gave the highest percentage, 200 parts dissolving .765 part of uric acid. From his experiments it is evident that the chlorides and sulphates have no influence in dissolving uric acid, and that the alkaline and earthy carbonates only increase the solubility of uric acid in considerable proportions. In diluted waters the solubility of uric acid remains proportional to the quantity of the alkaline and earthy carbonates; hence mineral waters poor in carbonates have little effect.

The calculation shows, moreover, that for the formation of an acid urate the following quantities of uric acid are needed:—

1	part of carbonate of lithium	= 4.54	parts of uric acid.		
1	“ “	magnesium	= 4.	“	“
1	“ “	lime	= 3.39	“	“
1	“ “	sodium	= 3.1	“	“
1	“ “	potassium	= 2.43	“	“

The greater the molecular weight of the carbonate, the greater its solvent action on uric acid.—*Ann. des Mal. des Organes Génito-urinaires*, Nov. 1883.

MEDICINE.

A Typical Case of Myxædema.

At the meeting of the Clinical Society of London, on November 23d, Dr. DREWITT exhibited a case and described it. The patient was a woman, aged 45, who had been an out-patient at the West London Hospital during the last year. The disease was of twelve years' standing, dating from a time when the poor woman lost her husband and one of her children. At that time, she was slightly built and active; but since then she had gradually become stout and heavy, slow and languid and feeble in moving, slow and deliberate and indistinct in her speech. She was afraid of going about alone, lest she should be run over; and she could hardly lift her feet high enough to get upstairs. She was always cold, even in summer, and never perspired. Her bowels were obstinately confined. There was dyspepsia, and she had partly lost the senses of taste and hearing. All the characteristics of the disease were present—the generally swollen look; the round and fat face; the sallow, translucent, wax-like skin; broad nose; thick, coarse, purple lips. On the cheeks was the same peculiar dusky reddish purple colour, caused by dilated capillaries and veins. The eyelids were pendulous and transparent; the tongue, which was pale, swollen, smooth, and tooth-marked, was too large for the mouth, and more “cretinoid” than the intellect; the soft palate was also swollen and pale. The abdomen was greatly enlarged, as if from growth of fat; the swelling, in fact, was universal, but there was nowhere pitting on pressure. The skin of the hands and arms was rough and scaly, as in xeroderma. The hands were thick and swollen, and could no longer be clasped. The wedding-ring became imbedded in the swollen finger, and had been cut out by a jeweller. Pulse 76, feeble. The heart-sounds were distant, feeble; there was no murmur. Temperature in axilla only 95°. Urine, specific gravity 1011; it contained no albumen nor sugar. Dr. Drewitt remarked that the spade-like clumsy hand had been especially noticed by Sir William Gull in his paper read before this Society, describing the disease for the first time, just ten years ago; but he thought that the most striking physical peculiarities were

the pendulous eyelids, like alabaster in translucency, and the purple pouting lips. Tranquillity was also, in those few cases he had seen, a most marked characteristic. Though painfully conscious of their state, these patients were not irritable. As to the pathology, Dr. Ord had described the *post-mortem* appearance. The whole connective tissue of the body had been found swollen and jelly-like, and œdematous, with mucin. The swelling seemed sufficient to account for all the symptoms. The heart and arteries were obstructed by it, and hence the feeble blood-current, the deficient aëration of the blood, and the purple of the cheeks and lips. The tongue and palate were swollen with it, the intestine choked by it, the senses dulled, the functions of organs interfered with, and the patients died with all their tissues smothered by their own padding. In treatment of this patient he had found strychnia of the most value, and both muscular movement and speech had increased in briskness under it. In the appearance of the patient, however, there had been no improvement. As to the origin of the disease, it had been, perhaps, rightly ascribed to nerve-influence. Great anxiety or mental shock had occurred at the beginning of many cases. In Dr. Ord's first case, as in the one now before the Society, it followed upon the fatal illness of a husband. In Dr. Cavafy's first case it followed a shock; in his second, a bad time at childbirth. Dr. Duckworth's second patient mentioned that it came on after her husband had kicked and ill-treated her. Dr. Semon's patient had fourteen children and some miscarriages in a "comparatively short time." Great mental anxiety or distress profoundly depressed man's vitality. The secretions of gastric juice, saliva, bile were all influenced by emotion; mental shock was given as a cause of atrophy of the liver, and syncope might follow bad news; therefore, it would not be wonderful if it should be shown that the nutrition of the connective tissue of the body were altered in this way. Sir William Gull in his paper had alluded to the changes in the thyroid in true cretins. It would be interesting to know whether instances, either of atrophy or hypertrophy of the thyroid, had been observed in any of these cretinoid cases.

Dr. FELIX SEMON called attention to a most important contribution towards the etiology of myxœdema. At the twelfth Congress of German Surgeons, held at Berlin, in April of this year, Professor Kocher, of Berne, read a paper on "Extirpation of Goitre and its Consequences." His personal experience was based upon no fewer than 101 total, or partial, extirpations of goitre, and was secondary to no living surgeon's, except that of Professor Billroth. His attention was drawn to the after-state by the report of the general medical adviser of one of his patients. Professor Kocher, having seen the patient in question himself, was so much surprised, that he immediately requested all his patients, upon whom he had performed that operation—except those only very recently operated upon—to present themselves for the purpose of a re-examination. By many circumstances (death, loss from view, cancerous nature of the goitre, inability of attending personally, etc.) the number of those attending was reduced to thirty-four. In sixteen of these cases a partial extirpation only had been made; *i. e.*, one lobe, with or without the isthmus, had been removed. In all the cases belonging to this category, the result of the operation had been an excellent one; the dyspnœa, for which the partial extirpation had been performed, had disappeared, and the general health had suffered in no respect. Matters, however, were different with regard to the eighteen patients on whom total extirpation of the thyroid body had been performed. Of these, two only showed an undeteriorated, or even improved, state of health; but it was remarkable that, in one of these two cases, a small accessory thyroid gland had undergone a hypertrophic change, and that, in the other, a recurrence of the goitre had taken place. All the remaining sixteen patients showed more or less considerable derangements

of their general health, which derangements, though all of the same kind, were different in degree, the changes being much more developed in the oldest cases than in those more recently operated upon. These changes were, therefore, of a distinctly progressive character. As to the nature of the changes themselves, they were, in the order as related by Professor Kocher, the following. A few months after the operation, early fatigue, weakness, and sensation of heaviness in the limbs were complained of. In many cases, these were preceded by actual pains in different parts of the body. Soon afterwards, a sensation of coldness, especially in the extremities, was superadded. In winter time, the hands and legs swelled, became bluish-red and cold, and the patients suffered from chilblains. The mental activity decreased. Thought, speech, and movements became slower. At the same time, the patients were themselves painfully aware of these facts. About simultaneously with the above-enumerated symptoms, swellings of the face and body made their appearance. They were sometimes at first only transitory, but generally soon became lasting features. The parts most and earliest affected were as a rule the infra-ocular region and the eyelids, which showed a somewhat transparent swelling; later on, the nose became thick, the lips coarse, the hands and feet swollen, the waist stouter. The skin became dry, desquamated a little, was infiltrated, its elasticity lost; it could only be lifted in thick folds. The hair fell out. A most marked symptom in the more advanced cases was anæmia. Examination of the blood showed a relative richness of leucocytes, inasmuch as the number of the red blood-corpuscles was greatly diminished. In those cases in which the patients at the time of the operation were still growing, their development became most markedly arrested after the operation. Rarer symptoms were: slight dysphagia, giddiness, headache. Ophthalmoscopic examination, made in a number of cases by Professor Pflüger, did not reveal anything abnormal, beyond remarkable narrowness of the arteries. Professor Kocher concluded his description by the remark, that the relationship of the above combination of symptoms to those of idiotism and cretinism was unmistakable. Being himself unaware of the existence of myxœdema, he proposed for the affection he described the name of *cachexia strumipriva* (struma-goître). Similar observations had been made by Professor Reverdin, of Geneva. Having given this report, Dr. Semon said that, in a case of his own, in which Professor Lister had kindly removed the thyroid body *in toto* three years ago, great pallor and occasional swellings under the eyelids had since made their appearance, as he had ascertained by making inquiries. The patient also suffered frequently from general malaise. He was, however, far from attributing too great a value to written reports, and communicated this for the sake of completeness only. Returning to Professor Kocher's paper, he regretted that time did not permit him to enter upon the highly interesting and ingenious hypothesis, by which this author tried to explain the nature of the changes described by him. He (Dr. Semon) thought, however, that the identity of these changes with those met with in myxœdema, which he had found when reading through Professor Kocher's paper, was very evident. Not one symptom was present in myxœdema which was not met with in these cases of total extirpation; on the other hand, one symptom only had been observed in a certain number of these cases which was not present in myxœdema, viz., the arrest of the growth of the body after total removal of the gland in children. But the explanation of this difference was obvious: myxœdema was essentially a disease of adult life. Looking upon the whole question from a broad point of view, there appeared to be three conditions closely allied to each other, and having in common either absence or probably complete degeneration of the thyroid body: namely, cretinism, myxœdema, and the state after total removal of the thyroid body. In all three states, certain

conditions of arrested development of mind and body were met with, which, looked upon in the new light thrown upon the subject by Professor Kocher's observations, could hardly be attributed to anything else but to the loss of the thyroid body, common to them all. Speculations as to how these changes were brought about, and what was the exact influence of the thyroid body upon the composition of the blood and other tissues, seemed at present to be premature; but it was perhaps not too bold an hypothesis to assume that, if the absence of the thyroid gland would lead to arrested development of mind and body, it might also lead to arrested development of higher forms of organized tissue, and that under such conditions the lowest type or organized tissue, the foetal tissue, mucin, could mainly be formed, and was formed, in excessive quantities. Thus the excess of mucin in the tissues, which had been supposed to be the essential feature of myxœdema, might possibly find its explanation.

Dr. ORD remarked that, when Kocher's paper was published, his (Dr. Ord's) friend Dr. Bemon at once drew his attention to it. By his advice, the speaker wrote to Professor Kocher, comparing his cases with myxœdema, and sending him some photographs. He wrote in return a letter, from which Dr. Ord now ventured to read an extract, indicating the way in which the coincidence had been regarded by him. "There cannot be the slightest doubt of the analogy of myxœdema and cachexia strumipriva. I was not aware of it before, having never seen a case of the affection. I think you will agree with me that, by my observations, the atrophy of the thyroid body, which you have found in your cases, gets much greater importance. According to what I have seen, the extirpation of the thyroid gland is the direct and sufficient cause of the whole affection. I thought that it was especially in young people that the symptoms were severe, and so it is certainly; but I have seen two cases in adults since the publication of my paper, and I grow more and more convinced that the excision of the whole organ, when nothing of it is left behind, has, as a necessary consequence, the cachexia. If that is the case, it seems not very probable that the lesions of fibres of the sympathetic nerve occasion an accidental neuritis of the same, because we do not see anything like that in excision of other organs. It would be necessary to state a peculiar relation of the thyroid body to the sympathetic nerve, to explain the constant affection of the latter. I hope to be able to have a necropsy, sooner or later, of one of my cases; and then it will be possible to compare it with the result of your most interesting *post-mortem* examination. If I am not mistaken, you do not speak of affection of the pupils or unilateral congestion of the face, or alteration of the function of the heart. I admit that the combination of affection of the thyroid gland, with irritation of the sympathetic nerve, in Basedow's disease, much induces one to think of an analogy in the opposite way. At any rate, the functions of the cerebrum seem to be impaired very soon. People lose memory, do not hear and see as well as before, cannot speak as they did before, complain of pain and excessive fatigue in all members." These observations certainly pointed strongly to the probability that atrophy of the thyroid body was, in some way or other, the cause of the condition, myxœdema. The very title of Sir William Gull's original paper; the cases of Mr. Curling; the paper of his lamented friend, Dr. Fagge, on Sporadic Cretinism; the very complete atrophy of the thyroid found at the *post-mortem* examination of his first case, all tended in the same direction. So, also, did Dr. Fagge's suggestion as to the sort of inverse ratio between goitre and cretinism, to which the report of the Sardinian Commission lent some support. But before he (Dr. Ord) could allow himself to express a decided opinion, there was still much to be observed and thought out. He handed round a photograph sent by Dr. Kocher, showing the after-condition in one of his cases. It showed, with characters of myxœdema,

marks of a cretinoid arrest of development, which did not, of course, exist in the cases where the disease had begun in adult life.

Dr. CAVAFY thought the natural history of the disease deserved much attention; so far as he had seen, the course was not one of uniform deterioration, but there were distinct periods of quiescence, or even improvement. The younger of the two cases he communicated to the Society two years ago was a good illustration of this; after leaving the hospital, she became pregnant, and, during gestation, suffered much from swollen legs and other discomfort; labour was protracted and difficult, owing chiefly to great œdema of the genitals, but the child was quite healthy. Soon afterwards, she came to the hospital to say she was much better, and all who saw her were struck with the marked improvement in her condition; the swelling of the face and hands was greatly diminished, her expression brighter, and speech nearly normal; but she gradually relapsed into her previous condition. He thought the improvement might be accounted for by the stimulus to general nutrition caused by the puerperal state. In another case, of a gentleman with marked myxœdema, whom he had seen once, he had been told that ascites supervened, and necessitated tapping on several occasions; ultimately the fluid ceased to reaccumulate, and it was then found that the characteristic signs of myxœdema had nearly disappeared, and he was better than he had been for many years. In this case, it seemed as if a deviation had taken place—the general œdema, which was probably to a great extent serous, having, so to speak, drained into the peritoneal cavity. These were the most striking instances which had come under his notice; but in every case he had seen, there had been longer or shorter intervals of more or less marked improvement, which he was unable to associate with treatment, or with any alteration in the general surroundings of the patient.

Dr. R. CROCKER said, in reference to the elimination of urea which had been observed to fluctuate in myxœdema, that too much stress must not be laid upon this. Some years ago, in making some experiments upon the influence of alcohol upon the excretions of a dog, he made a long series of preliminary determinations of urea, in order to ascertain the normal elimination of the animal, which was kept in exactly the same conditions as regards diet, etc. He found very wide fluctuations in the amount of daily elimination, and that without any apparent cause. In several cases of universal dermatitis, where the urea had been estimated, there had also been considerable fluctuations; it was obvious, therefore, that it would be necessary to carry on the observations for long periods before any reliable results would be obtained.

Dr. ORD said, in answer to Dr. Cavafy's question, that the first patient in whom he had studied myxœdema—as far back now as twenty years—bore two children after the condition was well established; and that there was no change in the symptoms during or after either pregnancy. No doubt, there were to be noticed in most cases such periods of seeming amelioration as Dr. Cavafy had mentioned; but, until within the last three years, he had witnessed in all cases a distinct tendency to progress from bad to worse. He was led by the desire to give one of his patients relief by diaphoresis to try the use of jaborandi. The effect of the drug after several weeks' use was so beneficial, that he had since used it in all cases. He might report that in all the cases it had given relief; that in some its use had been followed by a change for the better far exceeding what was observed in the ordinary changes of the disease; and that, in one or two cases, something like a cure had been effected. One patient certainly had lost all her œdema, had recovered her activity of body and of mind, and declared herself to be quite well. This was more than he (Dr. Ord) dared to say till after some longer lapse of time. The jaborandi was given in the form of a tincture;

thirty drops in a teacupful of hot water, with a little sugar, three times a day; the dose was gradually increased to sixty, ninety, or even one hundred drops three times a day; and the drug was given for months together.

Dr. WHIPMAN had heard with satisfaction the results of Dr. Ord's treatment of myxœdematous patients with jaborandi. It had occurred to him some time since that diaphoresis might relieve many of the symptoms. He began by trying hot air-baths in a woman recently under his care, but at first no sweating took place; on repeating the bath once or twice, fair diaphoresis was produced. Pilocarpin, subcutaneously injected, was then tried with the same patient, in doses of one-twelfth of a grain. It was found, however, necessary to increase the amount to one-fourth of a grain in order to produce the desired effect. The patient suffered more or less from headache on the day following the injection, but expressed herself as feeling greatly relieved, and "much lighter" in consequence of it. She was eventually sent to the Morley Hospital, much improved. A few days ago, however, she again presented herself for advice, all the good effects of the former treatment having passed off. Hot air-baths having produced but little sweating, the tincture of jaborandi was tried in drachm doses, but caused severe headache and sickness. The dose was probably too large.—*British Med. Journal*, December 1, 1883.

Etiology of Tabes Dorsalis.

In 1881, Professor Erb published his first series of 100 cases of tabes dorsalis, showing the frequency of previous syphilis in this disease. In 88 of these cases there had been previous syphilis, in 12 there had been none. Since that date, Fournier, in his work on Locomotor Ataxia of Syphilitic Origin (1882), gives the percentage of cases in which there has been previous syphilis as 93; Vogt, a former opponent of syphilitic tabes, in his latest statistics, gives the percentage as 81.4. The *Berliner klinische Wochenschrift*, No. 32 of this year, contains a paper by Erb giving a second series of 100 cases of tabes dorsalis. Out of this series, 9 only of the cases had had no syphilis, while 91 had had previous syphilis. Of these 91 cases, 62 had undoubted secondary syphilis, 29 had primary sores, but no secondary symptoms were noticed. Of these 29 cases, 5 had true hard sores, 10 were treated with mercury and iodide of potassium, and in 14 the treatment and the nature of the sore are not noted. The tabes dorsalis manifested itself at the following periods after infection with syphilis: 13 cases occurred between the first and fifth years, 31 between the sixth and tenth, 25 between the eleventh and fifteenth, 15 between the sixteenth and twentieth, 5 between the twenty-first and twenty-fifth, 1 between the twenty-sixth and thirtieth, and in 1 case the period was unknown. Thus 69 of the 91 cases occurred during the first fifteen years after infection, 15 in the period between fifteen and twenty years, and 6 still later. As a check observation Professor Erb ascertained that of 1500 patients who attended his clinic, who were not tabetic, 77.25 per cent. had never had syphilis, and that 22.75 per cent. had been infected. Of these latter 10.25 had suffered from secondary symptoms, and 12.50 from chancres only. From these observations he concludes that syphilis is such an important factor in the etiology of tabes dorsalis, that scarcely any one who has not had syphilis or a chancre has a chance of becoming tabetic. As to the other factors in the etiology of tabes (viz., heredity, catching cold, fatigue, sexual excesses, and injury), he considers them of much less importance; of the 100 cases of the present series he gives in 36 cases syphilis as the only assignable cause, in 17 cases syphilis and cold, in 8 syphilis and fatigue, in 7 syphilis and excesses, in 2 syphilis and injury, in 15 syphilis, cold, and fatigue, in 4 syphilis, cold, and excesses, in 3 syphilis, fatigue, and excesses, in 1 syphilis, excesses, and injury as the assignable causes,

and in 3 cases cold alone, in 2 cases fatigue alone, in 1 case excesses alone, and in 1 injury alone. Syphilis is thus the most frequent and important change of condition that favours the development of tabes, the other factors generally acting in company with syphilis.

The frequent paralysis of ocular muscles, the affection of the pupils, the presence of symptoms pointing to syphilitic affections of the cerebral nervous system (viz., hemiplegia, apoplexy, epileptiform attacks, and frequent headache); the presence of syphilitic affections of the skin, the mucous membranes, and the bones; the fact that in cases of tabes occurring late in life the patients have usually acquired syphilis late in life (in one case the patient acquired syphilis at the age of forty-eight, and became tabetic at the unusually late age of fifty-eight; in another case the patient, who had acquired syphilis at the age of thirty-eight, became tabetic at fifty); the relative frequency of syphilis and tabes in men and women (being in each disease as ten to one), the relative frequency of tabes and syphilis in women of the lower classes, the relative rarity of both in women of the higher classes;—these facts Erb considers of great importance in assigning syphilis as the most important factor in the etiology of tabes. The occurrence of previous syphilis in tabetic women he considers not at all infrequent, for, of 13 cases of tabes in women, 6 had a clear history of syphilis, 4 had no history, and in three cases the history was doubtful. From these statistics Professor Erb holds that syphilis is one of the most important, if not the most important, cause of the occurrence of tabes. That tabes is a specific disease, a late manifestation of syphilis, he does not consider to be proved, though he thinks it extremely probable.—*Med. Times and Gaz.*, Sept. 1, 1883.

Hemiatrophy of the Tongue in Tabes Dorsalis.

Among the various affections observed in the course of tabes dorsalis, and sometimes beginning early in the disease, is hemiatrophy of the tongue, a symptom to which but little attention has been paid. This hemiatrophy is, however, says M. GILBERT BALLET, quite frequent, and on account of its rarity in other cerebro-bulbar affections than locomotor ataxia, it has a high diagnostic value, and may materially aid in clearing up a doubtful case. This symptom has several times been observed by Professor Charcot in tabetic cases.

Hemiatrophy of the tongue is manifested by a very marked diminution of one side of the tongue; sometimes the right, at other times the left side being affected. The affected side presents numerous wrinkles and furrows, which give the affected side a sort of vermicular appearance. Sometimes there is noticed a slight trembling with fibrillar contraction. The tip, in a case under observation, points slightly towards the affected side. This lingual atrophy interferes but very little with speech, and, in the ataxics which Ballet has had under observation, it does not seem to interfere with deglutition or mastication.

In most of the cases observed, hemiatrophy of the tongue was associated either with ocular paralysis or with atrophy of certain muscles of the limbs. This last coexistence sufficiently establishes the fact that the pathology of lingual amyotrophic paralysis is the same as that of the muscles of the thenar eminence or of the forearm. What gives a particular interest to this symptom is the fact that it may appear after the first phase of ataxia, and constitutes the only ostensible and clear manifestation of the affection, at a time when other symptoms are only slight or have not even made their appearance; hence in these cases it becomes a highly important diagnostic symptom, so much so that tabes dorsalis may be safely diagnosticated when it is present.—*Le Progrès Méd.*, October 27, 1883.

Sclérose en Plaque in Infants.

Dr. PIERRE MARIE has a late article on this subject, in which several cases are reported.

Etiology.—As to age, the disease seems to affect children between fourteen months and fourteen years. It most commonly affects those about the age of three or four years. As to the sex, there seems to be a slight predominance in the male sex, eight boys to six girls. This result does not accord with the opinion of Charcot. The difference, however, is very slight.

The causes of the affection are not so easily discovered in youth as in adult life. As a rule, there is some anterior affection; in a case reported by Schüle, the child had had jaundice with albuminuria; in one reported by Pollard, the affection began during convalescence from scarlatina. These are not exceptional cases, but are analogous to the etiological onset of the disease as seen in adults, as in a case reported by Charcot and Joffroy the affection came on after an attack of cholera, with a subsequent attack of typhoid fever. During convalescence the patient complained of feebleness in the legs, the first indication of medullary sclerosis; this steadily progressed. In another case, reported by Charcot and Bourneville, the disease commenced during convalescence from smallpox; a similar case has been reported by Otto; one by Westphal following typhus fever; and several others following variola; and one reported by Ebstein coming on during an attack of typhoid fever. It would seem, therefore, that this is more than a simple coincidence, and, without pretending to relegate all scleroses of the nervous system to this pathogenesis, it must be regarded as an important element. In all the cases cited by Marie there is one especially striking fact, viz., all the previous diseases were of the infectious type. Does the infecting agent act directly by its presence, by localization in certain parts of the central nervous system, or by pathological products produced by itself, or by the animal economy under its influence? These products, passing through the lymphatics of the nervous system, irritate them; this irritation produces an interstitial proliferation, thus causing sclerosis of different parts of the central nervous system. The frequency of arterial lesions in infectious diseases is well known, particularly more or less generalized arteritis; and the relations between sclerotic patches with the distribution of the arteries has been clearly shown by Ribbert and Klein. There seems also to be a hereditary factor in the production of the affection. Wilson reports a case in an hysterical person; Dreschfeld reports two cases occurring in two brothers, and Cheadle reports a case in which the brother had chorea. The rheumatic and gouty diatheses seem also to play a part in causing the affection.

Symptoms.—The symptoms of the disease, as observed in children, are identical with those seen when it affects adults. Frequently it begins by difficulty in walking, paresis of one or more limbs, trembling, which is only noticed when voluntary movements are attempted, characteristic ocular troubles, as nystagmus and strabismus, either transitory or permanent, and articulation is embarrassed, being slow and monotonous, as in adults. In some cases there are convulsions or apoplecticiform and epilepticiform attacks. The trembling, noticed during voluntary movements, commences sometimes in one arm, sometimes in both. It may be so great that the child cannot carry food to its mouth. It often affects the muscles of the neck and trunk, so that, when locomotion is attempted, the head and upper part of the body are immediately seized with more or less violent oscillating movements. More often, however, the trembling commences in the lower limbs, so that walking is very difficult or impossible. Ten Cate Hødemaker described it as having the characteristics of spasmodic paraplegia. In one of

Bristowe's cases there was exaggeration of the patellar reflex. Another symptom sometimes seen, and which shows an approaching fatal termination, is glosso-labio-pharyngeal paralysis. The cerebral symptoms noticed in this disease are both frequent and important. These symptoms, of one kind or another, were seen in twelve out of fourteen cases. It is true that the psychological troubles may be extremely slight, and consist simply in some eccentricity or irritability; but while they exist in various degrees, their frequency is none the less remarkable. Sometimes the patients will laugh immoderately at a most trivial circumstance, and then suddenly burst into tears. Their intelligence may be blunted or very much weakened; memory becomes impaired, often the child cannot be taught to write; and, as in a case reported by Schüle, the mental powers gradually become weaker, and the patient passes into a state of complete imbecility.

As to the epileptiform and apoplectiform attacks already spoken of; an apoplectiform attack has been seen in one case, and epileptiform attacks in two. In six other cases, however, infants have had convulsions either at the beginning or during the course of the affection. But it should be remembered how common are convulsions during infancy. In Bristowe's case the patient had four attacks of somnambulism after the affection commenced.

The diagnosis is to be made between this affection and hereditary ataxia, chorea, spasmodic tabes, and infantile hemiplegia. There is no especial difficulty in making these diagnoses if the symptoms of the other affections be borne in mind. As to treatment, galvanism and nitrate of silver have been tried in vain. Nothing seems to produce any amelioration of the symptoms.—*Revue de Médecine*, July, 1883.

Mediastinal Tumours.

The infrequent occurrence of sarcomatous growths involving the pericardium, and the difficulty of diagnosing these cases have induced Dr. PAUL LIBORIUS, of Kronstadt, to report some interesting cases coming under his observation.

The first case reported is that of a sailor, æt. 34 years, who was under treatment in the Kronstadt hospital. The patient's history was as follows: In 1877, during the Turkish war, he was taken with intermittent fever. Previous to this time he had been in good health. He did not entirely recover from the malarial poisoning, and in 1881 he sustained a contusion of the forehead, which did not result seriously, however. In the early part of 1882, he was sick for six days with a pain in the left side, the left upper extremity and the head; this, however, did not prevent his performing his usual duties. In the spring of 1882, examination disclosed a cardiac murmur, but there were no subjective symptoms. A few months later, he complained of pain in the head, breast, and right shoulder. His temperature was 101.6° , there was a dry cough; percussion showed nothing abnormal, and auscultation only dry râles. On the next day the right shoulder was red and swollen, and movements gave pain; there was also slight swelling of the right ankle-joint. This swelling and pain completely disappeared in about a month, but the cough continued, and more pronounced râles appeared in the lungs with quite profuse expectoration, and some dyspnoea developed. This increased and the countenance became cyanosed, as did the hands. The intellect remained clear, the pupils reacted well and there was no headache. The chest was well-developed, and examination at this time showed nothing abnormal on percussion, vesicular breathing on auscultation, and moist râles under the left scapula. Respiration 32. The cardiac dulness reached upward to the third rib, and extended from the left mammillary to the parasternal line. The apex beat was in the fifth intercostal space. The sounds were only feebly audible, and there was a systolic murmur, most clearly heard over the aorta, though two of

the examiners claimed to hear it most distinctly at the apex. There was a feeble carotid murmur. Pulse small and irregular, and could not be counted.

The liver was slightly enlarged, and painful on pressure in the scrobiculum cordis. The appetite was small, there was constipation, and sleep was restless. The urine for twenty-four hours measured 400 c.cm., was dark-coloured, muddy and acid. Sp. gr. 1030, considerable quantity of uric acid salts, a few cylinders, and traces of albumen. Temperature 100.4°. The dyspnœa became so great that the patient was compelled to assume the sitting posture for the greater part of the time; while in bed he lay upon the left side. Administration of digitalis brought the pulse down to 100, and regulated the heart's action. No difference could be observed between the radial pulses. Œdema of the left upper extremity soon set in, from the middle of the *arm* downward. (The patient, as already stated, lay only upon the left side.) After this, œdema of the feet set in, and soon the expectoration became coloured with blood; then the right upper extremity became œdematous, the lower extremities soon becoming affected, the symptoms grew worse, and the patient died on Sept. 23d, having been taken ill on July 12th. *Autopsy*.—The chest was opened in such a manner that the heart and lungs could be removed while retaining their relative positions. It was then found that the pericardium, especially on the left side, was considerably distended and its cavity almost entirely filled with a large uneven tumour, containing coagula of dark-red dirty colour. This tumour occupied the place of the heart, which was pushed over to the right side, its left auricle and ventricle being strongly compressed. The cardiac valves, and those of the aorta and pulmonary artery, were intact. The heart substance was of tolerably soft consistence, and looked brown on section. The circumference of the tumour was as large as that of a man's head; long diameter 20, diameter 15 cm. The left upper part of the tumour perforated the pericardial sac, which was considerably thickened and firm in its whole left half, and was completely adherent to the tumour at the point of perforation. At the entrance of the left bronchus into the lung there was, in the tumour, a white nodule of the size of a walnut. On section this had the appearance of marrow, and was tolerably solid, and exuded a milk-like fluid on pressure. There were similar nodules in other parts of the tumour, but not so sharply defined. The aorta and pulmonary artery were so adherent to the tumour that they could not be separated. The lung, on section, was dry and pale. In the left upper lobe were two nodules, similar to those already mentioned. *Microscopical* examination showed the tumour to contain round cells of different size, with clear contour and glistening nuclei. An intercellular substance was recognized with difficulty. In some places only was a connective tissue stroma easily made out. There were also small round cells with small nuclei and fine granular protoplasm. The tumour was diagnosticated as sarcoma; sarcoma globocellular telangiectodes, or sarcoma mixtum telangiectodes.

A second case giving similar symptoms was diagnosticated post-mortem as: Medullary sarcoma of the posterior mediastinum with perforation of the left auricle by the tumour. Thrombosis of the veins emptying into the superior vena cava; double hydrothorax; œdema of the lungs and cellular tissue of the whole body. A third case is also reported of round-celled sarcoma involving the brain, lungs, and pericardium. In 7566 cadavers examined at the marine hospital at Kronstadt, there were found 158 malignant tumours, 127 being carcinomatous. These occurred in 81 men of an average age of 53 years, and 46 women of average age of 56. The other 31 cases were of sarcomatous tumours, with an average age of 41 years; 20 being men of average age of 38, and 11 women of 48 years. Sarcomata affected the heart, lungs, and pericardium in only 4 cases.—*Virchow's Archiv*, Bd. xciii. Heft 3.

Myocarditis in Diphtheria.

UNRUH (*Jahrbuch für Kinderheilkunde*, Band xx., Heft 1) has met with myocarditis in eight out of 237 cases of diphtheria, and also in one case of scarlatina. Of these nine, six were boys. Two of the children were 6 years old, two 11 years old, and the remaining five were aged 7, 8, 9, 10, and 12. There was nothing in the history of any of the cases to account for an affection of the heart. The diphtheria was always of a severe kind, and involved the uvula and pillars as well as the tonsils; the false membranes were fetid and of a dirty greenish colour, and left deep ulcers after their removal. The heart affection began to make its appearance as soon as the diphtheria had ceased to spread. This was from the seventh to the fourteenth day, except in one case, where it was delayed until the twentieth day. The first symptom of the heart being involved was furnished by the pulse, which suddenly became small and empty. Its frequency was at first unaltered, but, after twenty-four or thirty-six hours, was greatly increased (160–180); at the same time, the pulse became irregular. Both these qualities were greatly aggravated by changes of position. The heart's impulse was, in this stage, perceptibly and palpably weaker, and a little to the right of its normal situation. The heart's dulness extended in all the cases beyond the midsternal line, and in two (one being the fatal case) it reached a finger's breadth beyond the right sternal margin. With convalescence, it returned to nearly its normal dimensions. On auscultation, the first sound of the heart was diminished in intensity; and, when the complaint was at its height, a blowing sound, like a chlorotic murmur, was heard. In only one case was there any præcordial pain. No information was derived from the thermometer. No purpura or other hemorrhage was observed in any case; and, somewhat remarkably, dyspnœa was absent in all. The patients were drowsy and apathetic, indeed too much so to ask for nourishment. Albuminuria was present in all. The albumen first appeared when the diphtheria was at its height; then it subsided, but reappeared in greatly increased quantity soon after the heart-affection showed itself. At the same time the urine diminished in quantity, and œdema, with in one case ascites, set in. The first symptom of amendment was the lessening of the albumen.

Of the nine children only one, a boy aged 11, died. The heart in this case, examined *post mortem*, exhibited a number of rather dark-coloured deposits of various sizes, some imbedded in normal muscular tissue, others in tissue which showed fatty infiltration or degeneration. The fasciculi were separated by spaces occupied by numerous cells. The striping was faint or imperceptible. All of these changes were more marked on the right side. There was no extensive fatty degeneration of the heart.

The first few cases were treated with digitalis or ergot, but neither drug had much effect. Camphor was then tried, and with marked benefit. It was given in combination with perchloride of iron. Stimulants were freely administered. The author anticipates the objection that the cases which recovered might have been simple neuroses of the heart, and founds his strongest argument against it upon the widening of the præcordial dulness. But this was marked in two cases only.

[The author would have done better to have given separate notes of the fatal case. But the weakest part of the paper is that which relates to the necropsy. We are not informed upon the following points: 1. Was the heart dilated or enlarged? 2. Of what nature were the "numerous cells?" 3. Did these cells represent the structure of the dark deposits? 4. Were the spots found in any other organ? In the absence of information upon these points, the diagnosis of even the fatal case cannot be unhesitatingly concurred in. *Rep.*—*London Med. Record*, November 15, 1883.

*The Prognosis of Mitral Stenosis, Pure or Complicated, up to
Fifty Years and over.*

Dr. DUROZIEZ, in an article on this subject, divides his cases of diseases or lesions of the heart into two classes, those in patients up to fifty years of age, and those of fifty years and over; of the latter class, he gives 193 cases. Of these 193 cases there are 35 of pure or complicated mitral stenosis. It may be interesting to know if many who suffer from mitral stenosis pass the age of fifty years, and what effect other cardiac lesions have on cases of mitral stenosis. Can we give these patients the hope of a relative longevity? This matter has received but little attention from authors. Autopsies of persons suffering from mitral stenosis, who have attained the age of fifty years, are very rare; and the observations of non-fatal cases are not more common, although we can to-day diagnose mitral stenosis with about the same certainty as we can pneumonia.

Persons suffering from mitral stenosis live longer than is generally supposed. In the text-books the degree of asystolism is regarded almost to the exclusion of the personal appearances. Without doubt there are sufferings of greater or less intensity, but the patient lives. We say that the period preceding asystolism is long or very long, but this is indefinite. We say that the subject of mitral stenosis lived long, because the lesion commenced late. It is far from easy to fix upon the exact date of the commencement of a cardiac lesion; it is not sufficient to date from a certain attack of acute rheumatism, as Duroziez has had cases of mitral stenosis under observation for more than fifteen years which are still in good general health.

Classifying his 35 cases by their complications and aggregate ages we find that: 10 cases of mitral stenosis with mitral insufficiency aggregate 554 years; 9 cases of uncomplicated mitral stenosis give 487 years; 4 cases of mitral stenosis with aortic insufficiency give 232 years; 4 cases of mitral stenosis with mitral and aortic insufficiency and aortic stenosis give 225 years; 4 cases of mitral stenosis and insufficiency with aortic stenosis and insufficiency give 213 years; 1 case of mitral stenosis with aortic insufficiency and tricuspid stenosis and insufficiency gives 58 years; 1 case of mitral stenosis with mitral and tricuspid insufficiency gives 57 years; 1 case of mitral stenosis with tricuspid stenosis and mitral, aortic and tricuspid insufficiency gives 55 years; 1 case of mitral stenosis with aortic stenosis and insufficiency gives 52 years.

It is seen that mitral stenosis with mitral insufficiency heads the list with 554 years for 10 cases, with pure mitral stenosis next, 487 years for 9 cases. We find, however, that a tricuspid lesion is a very important factor in determining a fatal issue, only three living cases being given. We are also struck by the weight which aortic lesions seem to have. Lesions of the mitral valve permit the attainment of 60 years of age; those of the aortic orifice at most 50 years; those of the tricuspid scarcely 40 years. Of the 35 cases, 18 are males, and 17 females. Duroziez draws the following conclusions: 1. Mitral stenosis (so large as to permit the passage of a finger and giving rise to characteristic bruits), pure or complicated, by other valvular lesions, exceptionally permits one to pass the age of 60 years. 2. A complicating mitral insufficiency does not aggravate the prognosis. 3. A complicating stenosis does aggravate it. 4. A complicating tricuspid lesion makes the prognosis very grave.—*L'Union Méd.*, August 5, 1883.

Paroxysmal Hæmoglobinuria.

Dr. STEPHEN MACKENZIE read a paper on this subject at a late meeting of the Medical Society of London. He commenced by relating three cases. Case

1 was a boy, aged thirteen, who had always lived in the East-end of London. His disease commenced at Christmas, 1881, and lasted till August, 1882. The attacks occurred whenever he went out into the cold air, and only under these circumstances. This occasioned a chill, followed by the passing of water like porter or port wine. In a few hours the urine became quite natural. Case 2 was a man, aged fifty-five, who had an attack eighteen years before, lasting a few weeks. He remained free until the present year, when he again became affected, and the attack lasted three months. Each paroxysm was excited by exposure to cold, when the urine became porter-coloured, and in a few hours, after the patient became warm, it resumed its natural appearance. Case 3 was that of a gentleman, fifty years of age, who had suffered from the disease for twenty-three years. Each attack was invariably excited by cold. The urine between the attacks was natural in colour. This patient had had primary syphilis, but no sequelæ; the others had not; and none of the three had suffered from malaria. Dr. Mackenzie then described in detail the peculiarities of the paroxysmal and inter-paroxysmal urine in this disease. The blood colour of the urine was due to hæmoglobin, as shown by the guaiacum and Heller's tests, and spectroscopic examination, methæmoglobin being sometimes, but not always, present. A few blood-corpuscles were sometimes found, but more often they were entirely absent. The other phenomena of the paroxysm were then described, and what was known of the pathology of the disease was next reviewed. Two things were certain: (1) that blood destruction or dissolution took place somewhere; (2) that this was, in the great majority of cases, due to the influence of cold acting on a morbidly sensitive reflex nervous mechanism. Probably a second factor was present in a peculiarity of the blood-corpuscles. As to where the blood destruction took place the evidence was not quite conclusive, but some recent observations of Boas and others suggested that it was in the exposed parts affected by the cold. Allusion was made to the connection between this disease and the "local asphyxia," or symmetrical gangrene, described by Raynaud, and examples of which had been recorded by Wilks, Southey, Barlow, Mahomed, etc. It appeared possible that in some cases there was an imperfect formation of the blood-corpuscles, which, under the influence of cold, and possibly carbonic acid, parted with their hæmoglobin more readily than in health. Hæmoglobin had been shown in some cases to be present in the serum. It might be that the kidneys were passive, as whenever dissolved hæmoglobin circulated in the blood, the kidneys separated and eliminated it. This was shown in toxic conditions, as in poisoning with arseniuretted hydrogen, naphthol, chlorate of potash, etc., and in certain fevers, as well as in the hæmoglobinuria of cattle and horses. Some sections were shown of the kidney prepared by Dr. Dreschfeld, of Manchester, from a fatal case of hæmoglobinuria from chlorate of potash poisoning. It might be that in some cases the blood destruction occurred in the kidney, but it was certain in some cases that it occurred elsewhere. The few post-mortem examinations that had been made threw no light on the nature of the disease, which occurred at all ages, with a marked predominance in young males. Syphilis had been shown to have been an antecedent in several cases, and the disease had been cured in some such by antisiphilitic treatment. In others malaria was apparently the cause of the disease, though not in all. Rheumatism had been associated with the disease. It was possible in these dyscrasias that an imperfect blood formation took place. As regards treatment, syphilis should be inquired for, and when present treated. In the majority of cases quinine was the remedy of greatest service, even in cases evidently not malarial. Probably some patients who got well when taking quinine would have done so without it. Most patients found by experience that the only way to prevent attacks was to avoid exposure

to cold by clothing and habits. But it was possible, as suggested by Dr. Barlow, that gradual accustoming to cold might be at once the most philosophical and successful mode of treatment, and this was decidedly worthy of trial.

Dr. DICKINSON said that he had had large experience of such cases. Sixteen cases had been under his own care, and for one more he was indebted to Sir William Jenner. One fact which came out very prominently from this collection of cases was the remarkable influence which ague or malarial disease seemed to play in the causation. Five of the cases had had ague, and three had resided in a malarial district. In two, other members of the family had suffered from ague; and except in three cases, a strong presumption of malarial influence existed. It must be remembered that malarial conditions of body are very tenacious and come out whenever they have a chance, thereby earning the title of an insidious disease. Paroxysmal hæmatinuria resembled an attack of ague in many ways. It might be said metaphorically that the disease eliminated itself by the kidney rather than through the skin, as in ordinary ague. Then the association of ague and hæmatinuria had been noted, as in a case recorded by Dr. Mackenzie. Dr. Dickinson had had the case of a young woman who had contracted malaria in India under his care. There were undoubted attacks of ague associated with hæmaglobinuria, hemorrhages in various parts of the body, and purpura. Under the influence of quinine the patient got nearly well; but died some time later from perforation of a typhoid ulcer. At the autopsy, the kidneys showed signs of inflammation in the overgrowth of fibroid tissue and in the blocking of tubes. Besides there were many areas of interstitial hemorrhages to be seen around, but not in the Malpighian bodies. That cases get well of their own accord there could be no doubt. And of the value of large doses of quinine continued for a long time, Dr. Dickinson had no doubt.

Dr. Mackenzie replied that he did not ignore ague as an element in the causation of the disease. But there were cases, as in one of his own, where no suspicion of malaria could be entertained.—*Lancet*, Nov. 17, 1883.

Cases of Thickened Epidermis treated by Salicylic Plaster.

At a late meeting of the Clinical Society of London (*British Medical Journal*, December 1, 1883), Dr. THIN gave an account of cases of thickened epidermis treated by salicylic gutta-percha plaster. The plaster which he used was manufactured by Herr Beiersdorf, of Hamburg, at the suggestion of Dr. Unna, who had introduced it into practice.

The first case which he related was that of an adult man, in whom a tendency to extreme tylosis of the soles and palms was hereditary. The palms and soles in this man's case were covered with an extremely thick and hard epidermis, and had been for many years in this condition, the affection having resisted very various methods of treatment. The treatment by the plaster was, in the first instance, recommended by Dr. Unna, and the author simply continued Dr. Unna's treatment. Under the use of the salicylic plaster, which was kept constantly applied by means of bandages, and changed every third or fourth day, the hard layer of epidermis came off in one mass, leaving a delicate rose-coloured epidermis behind it. There was neither pain nor inconvenience connected with the use of the plaster, and the patient, a business-man actively employed, was able to follow his usual avocation without interruption.

CASE II.—A gentleman, aged 72, who had always been healthy, was unable to walk for a period of six or seven months on account of an attack of sciatica. When the sciatica was relieved, he somewhat suddenly resumed his professional employment in the city, which at the time involved a good deal of walking on

the hard pavement. The result was that the soles of both feet became hot and tender, and, after a few weeks, the skin of the ball of each foot became hard and horny. When he consulted the author, this condition had lasted for about seven years, and gave rise to much pain and discomfort. The whole of the surface of the ball of one foot and part of the surface of the other were covered with a layer of epidermis of extreme hardness. In this hard layer, there were small isolated horny formations of the nature of corns, which produced the same sensation as if the patient were walking on shot, or small hard stones. The first treatment recommended was the application of strong solutions of potash, scraping with a sharp spoon, and wearing a horse-hair pad in a large boot. This alleviated the condition, but the application required to be frequently repeated. The salicylic plaster relieved the condition for several months at a time.

CASE III.—In a gentleman, aged 43, the palmar surface of the right forefinger had been covered for years by a thick hard fissured epidermis. After this morbid formation had been removed by the salicylic plaster, the skin of the finger had remained normal when the patient was seen by the author nine months afterwards.

CASE IV.—A gentleman, aged 40, had suffered from the condition of his heels for about twenty years. It had begun by the skin being red, tender, and scaly, and the hardness had gone on progressively increasing. The condition had been on several occasions mistaken for syphilis, and amongst other methods of treatment which had been employed in vain, several antisyphilitic courses were to be reckoned. When seen by the author, the skin of both heels was covered by thick hard horny uneven masses, which rendered walking very painful. Solutions of potash and a scraper, which were first recommended, had been used faithfully for a year almost daily, but with only temporary alleviation. When the author became acquainted with the specific action of the salicylic plaster it was recommended to the patient. Although by its use the tendency to horny formation was not removed, yet the hard masses had been completely got rid of, the patient could walk with comfort, and with the occasional use of the plaster the fresh formation of hard masses was avoided.

The author regarded the condition of which these cases were examples as being essentially allied to eczema. The formative power of the epithelium was injured mechanically or otherwise, and an imperfectly formed epidermis resulted. By its solvent power on horny epidermis, salicylic acid incorporated with gutta-percha, as in Beiersdorf's plaster, freed the skin from an adherent irritating mass, and the deeper layers of the rete mucosum were placed in more favourable conditions for regaining their physiological properties.

Mr. BUTLIN said that Mr. Thomas Smith had employed salicylic acid to remove a wart on his own person, the unhealthy appearance assumed by the growth having caused him much uneasiness from its resemblance to an epithelioma. Since this experience the remedy had been used with some success in cases of ulcerating carcinoma, rodent ulcer, etc. In a case of epithelioma of his own, however, he (Mr. Butlin) had not employed the salicylic acid, having agreed with Mr. Smith that, though it might prove of service, yet his duty to the patient demanded more positive and reliable immediate treatment. Hitherto he had known of no real example of epithelioma so cured, and was disappointed at not hearing from Dr. Thin that such results had been obtained.

Mr. M. BAKER described a case occurring in the syphilitic female ward at St. Bartholomew's Hospital, in which a number of warts were reduced by application of a cream of salicylic acid and vaseline. He thought the preparation used by Mr. Smith resembled the "corn-solvine" sold in shops, which consisted of a saturated solution of the acid in collodion.

Histology of Strumous Pseudo-Elephantiasis.

M. ALBERT MATHIEU has a recent note on this subject.

Independently of elephantiasis, properly so called, or elephantiasis Arabum, there exist a considerable number of cases of false elephantiasis but little known and insufficiently classified. The characteristics common to these different affections are: their long duration, slow evolution, acute eruptions, and deformities of the skin. Pseudo-elephantiasis should be described with lupus scrofulosis, of which it is really only a clinical variety.

The principal characteristics are: 1st. It is situated more particularly on the inferior members; is characterized by a permanent œdematous state of the skin and the subcutaneous tissue, which causes a marked deformity of the leg and foot. Not only does œdema exist, but an induration attributable to chronic dermatitis, which resembles true elephantiasis. 2d. Its situation is different from that of elephantiasis Arabum. The latter produces a considerable swelling of the skin of the lower limbs, which is arrested at the level of the malleoli, leaving the foot almost normal, giving the appearance of a pantaloön below which the foot is seen. Strumous pseudo-elephantiasis is characterized in the lower limbs by a swelling which involves both the foot and leg. The thigh is but little affected, and later, the disease slowly ascends toward the hip. 3d. When the œdema and dermatitis have lasted for a certain length of time, papillomatous projections are developed which seem, to the naked eye, to be due to hypertrophy of the normal papillæ of the skin. This is confirmed by microscopic examination. 4th. In certain regions, and more often in those which have been primarily occupied by the papillomatous projections, ulcerations develop, the appearance of which is entirely similar to that of the ulceration of lupus scrofulosis. 5th. The œdema and chronic dermatitis develop by successive cases. At certain times, and under influences often not well determined, there are inflammatory eruptions very much resembling the erysipelatous eruptions of strumous subjects. These inflammatory eruptions are analogous to those seen in true elephantiasis and in old syphilitic and paludal subjects affected with pseudo-elephantiasis œdema of the lower limbs.

In the latter part of 1882 there died at Saint Louis, in the service of M. Lailler, a woman who had suffered with strumous elephantiasis for several years. Histological examination of portions of the skin taken from various places of the lower limbs showed the following interesting peculiarities.

1. *Lesions of the Papillæ.*—In the regions in which the skin commenced to take on a papillomatous aspect, the papillæ were very much enlarged. They were infiltrated by embryonal elements disposed in linear rows. These rows were directed from the bases towards the summits of the hypertrophied papillæ. There was a true lymphoid infiltration of these papillæ.

2. *Modifications of the Epidermis.*—The epidermic layer was very much thickened. The superficial cells were swollen, voluminous, sometimes containing vacuoles, always separated from one another by an interstitial substance. The stratum lucidum was very marked, and was strongly coloured by picric acid. The interpapillary depressions were deeper when the papillæ were larger. Perhaps, however, the increased size of these spaces was not due simply to the increased dimensions of the papillæ. In certain places there were found anastomotic spaces which penetrated deeply into the subjacent tissue. These spaces, which resemble an irregular network, are made up of flattened and piled-up epithelial cells. In other points are found lobulated masses similar to the collection in the bulbous roots of certain epitheliomata. It seems then that the epithelial layers are encroachments. Furthermore, it is to be remarked that in the points in

which the lesion is least advanced, one may easily distinguish the deep layer of the epidermic cells from the interposed cells, while in the anastomosing spaces only masses of pavement cells can be recognized.

3. *Ulcerations.*—Papillary and epidermic lesions are found in the circumference of the ulcerations. As one comes nearer to the ulcerations in the examination, the embryonal elements become more numerous, and finally are so abundant that it is impossible to find any trace of normal dermal elements. On the borders of the ulceration it is seen that the pavement layer disappears, then the deep layer of the epidermis, and finally the papillæ. The depth of the ulceration is made up of a layer of very numerous embryonal elements, between which are perceived here and there the spaces of epithelial origin already described. It seems at certain points that the embryonal elements united in small rounded masses, as arranged in the form of tuberculous nodules, and in fact one sometimes sees, toward the centre, yellowish opaque masses made up of elements which seem very like giant-cells.

4. *Lesions of the Subcutaneous Tissue.*—The sudoriparous glands are inflamed, their epithelium being in process of proliferation and desquamation. It will often be found that the embryonal portions have followed their excretory canals from the surface toward the deeper portions, and lymphoid masses are formed around the glands. Other elements are found along the vessels, others still are completely isolated. It is probable that some may be found in lymphatic trunks. The cellular tissue appears to be thickened, and the fasciæ are indistinct; they seem to be glued up with a semi-opaque celloid substance. The layers are well coloured by violet and methylaniline; this colour is found in the walls of some sudoriparous glands, of arterioles, and in the thickened layer which the stratum lucidum forms. It seems, therefore, that amyloid degeneration exists in these different points.

The histological examination appears to be in favour of the similarity which was stated, in the beginning of this note, to exist between pseudo-elephantiasis and lupus scrofulosis. Are these lesions related to tuberculosis? Boiteux reports a case in the *Revue de Chirurgie*, 1881, of a young girl having ulcerations and strumous osteitis of the toes which seemed to be due to successive cases of erysipelas or lymphangitis *en masse*. There was chronic œdema with dermatitis of pseudo-elephantiasis appearance. Histological examination showed the existence of abundant embryonal infiltration of the skin, and numerous tubercular follicles. With this case is cited one of true elephantiasis, contracted in a warm climate, in which cutaneous sclerosis predominated, the comparison of the two making the difference very striking.—*Le Progrès Méd.*, Dec. 1, 1883.

SURGERY.

Removal of the Tongue.

Mr. W. MORRANT BAKER read a paper on this subject at the fifty-first annual meeting of the British Medical Association, in which he said that the important matter in all cases is, that there shall be a large margin of healthy tissue removed with the cancer; and this is quite easy of performance by any method. Such cases, however, are exceptional; and, in the others, in which the disease extends at least to the level of the last molar tooth, or invades the mucous membrane of the floor of the mouth or the gum, or in which there is more or less abnormal

fixity of the organ to neighbouring parts, the choice of operation is of consequence. As before, however, the most important question, by far, is this: How can the disease be most completely removed without undue risk to the patient's life?

I do not propose to consider here the comparatively rare cases in which the disease cannot be removed without complete division of the lower jaw. Such cases form a class by themselves, and may or may not be best dealt with by median division of the tongue and the use of the *écraseur*. I will assume that section of the bone is not necessary, and that the operator has decided to use the *écraseur*. Under such circumstances, the following is the plan which I believe is the best to be adopted:—

A gag having been introduced, and any jagged teeth likely to be in the way of the operator having been extracted, two threads are passed through the tongue, about an inch behind the tip and half an inch on each side of the middle line. One of these looped threads is now given to an assistant to hold tightly; and the operator, holding the other, scores the dorsum of the tongue with a blunt-pointed scalpel, exactly in the middle line—extending the “cut” well through the mucous membrane in the surface of the muscular substance, and dividing the tip freely down to and through the middle line of the frænum. The cut may be extended back as far as the operator deems necessary—say, for an inch beyond the level of the posterior edge of the cancer. He then takes both threads, one in each hand, and, using the forefingers much in the same way that he would for tightening a ligature on a deep vessel, he splits the tongue into two halves. At this stage of the operation, the hemorrhage is usually very trifling, if the operator has taken care to cut along the middle line; and, even if he is a little to one side or the other, the divided vessels are small and easily ligatured. The thread which tethers the diseased half of the tongue is now pulled quite taut, either by the operator or his assistant; while the former, with blunt-pointed scissors, snips, as far as he considers necessary, the mucous membrane and muscular fibres which connect the tongue with the anterior part of the lower jaw behind the symphysis, after the manner suggested many years since by Sir James Paget. He then “runs” the scissors along the floor of the mouth, immediately beneath the mucous membrane, keeping close to the ramus of the jaw, until he has cut, if possible, to a point beyond the level of the posterior edge of the cancer. Then, with his forefinger and by occasional snips with the scissors, he frees the tongue as completely as may be requisite from its attachments in front and at the sides and in the floor of the mouth. The chief point aimed at, of course, at this stage of the operation, is to free the diseased half of the tongue in such a manner that it may be surrounded by the loop of the *écraseur* at some distance behind the disease, and without danger of the cord slipping forward so as to embrace the neighbourhood of the cancer, and much less the cancer itself.

This is by far the most important part of the operation; and, should the surgeon be in doubt about his having sufficiently freed the tongue with his finger, he should again introduce the scissors, and cautiously divide any muscle or other structure which prevents the due loosening of the tongue. Having now freed the tongue sufficiently, one, and sometimes two, blunt curved needles (of the pattern shown) are now made to perforate it at some distance, an inch, or more if possible, behind the cancerous mass; and the loop of the *écraseur* is now slipped over the diseased half of the tongue, and adjusted behind the needles. With the screwing-up of the *écraseur*, this part of the operation is now completed, with the exception that, very commonly, at least when whipcord is employed, the main vessel and some other tissue, perhaps nerve-fibres, are pulled through the end of the *écraseur* after the softer substance of the tongue has been

crushed through. Under these circumstances, a double ligature should be passed with an aneurism-needle, and the strand of vessels and nerves divided between the two knots, when the *écraseur* will, of course, at once come away, and the main vessels will be left on the face of the stump securely ligatured.

In the event of both sides of the tongue requiring removal, an *écraseur* should now be slipped over the other half after it has been sufficiently freed from its attachments, and the diseased part guarded by a blunt-pointed needle. This part of the operation, on account of the space gained by the removal of half the organ, can be performed with comparative ease and rapidity.

After the removal of the tongue, wholly or in part, as the case may be, it should be carefully examined with reference to the question of how much healthy tissue has been removed with the cancer; and the floor of the mouth and stump of the tongue should be carefully examined also, with the same object in view. In freeing the tongue from the floor of the mouth, portions of mucous membrane, sublingual glands, and the like, are often loosened; and these can be readily dissected away when space has been gained by removal of the tongue. Lymphatic glands should also be searched for, especially in the submaxillary fossa. Should any be found, now or previously, an incision should be made through the skin over them, and they should be carefully enucleated.

In many cases, the removal of the tongue is greatly facilitated by previously dividing the cheek from the angle of the mouth to the anterior border of the masseter—a little below the line of the parotid duct—as recommended by Collis, Gant, Furneaux Jordan, and many others. This should be, I venture to think, always done if the disease extend far back. The scar is afterwards but trifling, if a little care be taken in applying the sutures of union.

It is often advisable, especially when the disease has advanced into the mucous membrane of the floor of the mouth, to extract three or four of the neighbouring teeth from the lower jaw; and, when the disease approaches or invades the gum, much valuable space may be gained (much more than would be imagined by one who had not done it) by cutting away also a portion of the alveolar border of the lower jaw.

With regard to the *écraseur*, the choice of instrument is a matter of secondary importance; at the same time, it is not unimportant altogether. The instrument which I have been in the habit of using of late is of very moderate length and weight, and is somewhat curved on the flat near the end. (Pattern shown.) The pattern is almost identical with that which my colleague Mr. Harrison Cripps has recommended for removal of the lower end of the rectum; but I prefer working both limbs of the looped cord at the same time, and therefore have a double instead of a single hook, and have no perforations at the shoulder of the instrument. The material of the cord which I much prefer to any other is a thick kind of whipcord. (Specimens shown.) It is more easily manageable than any kind of wire, and very much more than the linked chain. For some years past I have not met with any case in which the cord has broken under the strain of cutting through the tongue; nor have I ever had, so far as I can remember, any case of recurrent hemorrhage after the operation. This last advantage I am inclined to attribute partly to the fact that a whipcord or wire loop, and more especially whipcord, will, usually, after the tongue has been crushed through, drag through the end of the *écraseur* a small strand of tissue containing the chief vessels, to which a ligature can be applied before the removal of the *écraseur*. The being able to tie the main vessel at the end of the operation enables the operator to screw up the *écraseur* more rapidly than he would have otherwise ventured to do. I think it is a good plan to apply a ligature to the main vessel,

if it can be seen on the face of the stump, if it has not been tied before the removal of the *écraseur*.

I have now removed the tongue, wholly or in part, thirty-six times, and in all but three by the method here described. Of the thirty-five patients (one of whom was operated on twice, at an interval of four years and a half, thus making the thirty-six operations), thirty recovered, and five died. Of the deaths, one was from diphtheria, beginning about ten days after the operation; two from septicæmia; and one from general debility, arising chiefly from other causes than the cancer of the tongue; and one died six weeks after the operation from sub-acute pneumonia, the symptoms of which began about a week after the operation, with cough and slightly raised pulse and temperature, and consolidation of the base of the left lung. All the symptoms proceeded quietly to the last, the patient having recovered quickly from the immediate effects of the operation, and being able to take carriage-exercise for some weeks to within a day or two of his death. The sputa were offensive, and I have no doubt that the inflamed lung-tissue had in part broken down.—*British Med. Journ.*, Oct. 20, 1883.

Colotomy in Syphilitic Ulceration of the Rectum.

In a paper on this subject Dr. EUGENE HAHN says that it has not yet been determined whether the so-called syphilitic ulceration of the rectum, which is exclusively confined to females, and can often be observed in syphilitic women, is certainly of syphilitic origin or not; whether they must be attributed to the secondary or tertiary period; or arise from mucous patches, condylomata, or gummous nodules; or whether they are not of a syphilitic nature, and arise from infection with gonorrhœal secretion, or are the product of infection from a soft ulcer, is still unsettled.

Hahn has seen fifty cases and made about thirty autopsies, and is confident that he has seen some cases of the so-called syphilitic ulceration of the rectum which could not have been attributed to a syphilitic origin.

The views of different authors on this question differ widely. Some, as von Bärensprung and Fournier, hold to the syphilitic nature of this ulceration, and assign it in different periods to mucous patches or to gummatosa. Fournier ascribes it to the tertiary period, and distinguishes between these ulcerative or gummatous forms, and those called by him the ano-rectal syphiloma, which begin in the submucous tissue. Pathological anatomy has not yet determined this question; as Virchow says that he has had no opportunity to observe the first stage of the process, and must, therefore, leave it doubtful whether the ulceration ordinarily has a condylomatous or gummous beginning, or whether it is chiefly of a secondary nature. Its almost exclusive appearance in women favours the primary nature of the disease. As far as the customary local and general treatment is concerned the results are usually very poor.

Antiseptics, astringents, and cauterants, in powder and ointments, slitting of the stricture, the sharp spoon, and the actual cautery, bougies, iodide of potassium, inunctions and injections, all alike seem to be equally inefficacious in many of these cases. The purulent discharge continues, and the patient goes on from bad to worse. Some die from the great drain on the system, with amyloid degeneration of the different organs, others of pyæmia or septicæmia. It occurred to Hahn that if the fecal matter could be kept from the surface of the ulcers of non-syphilitic nature, they could be cured by judicious treatment; and by anti-syphilitic remedies; if they were of specific origin, they could be cured. He, therefore, proposes colotomy, and reports the following case:—

A woman, æt. 25 years, prostitute, with a severe rectal affection, came under

his care. The purulent discharge, in spite of the most assiduous treatment, continued to be enormous, amounting to about a litre per diem. Different antiseptics, astringents, and cauterants were tried in vain, as was general treatment with iodide of potassium and mercury. The same treatment had been tried in other hospitals without success. The patient was losing strength and flesh daily, until finally she was reduced in weight to 68 pounds. Examination showed a complete rupture of the perineum, with a large cloaca between the vagina and intestine. The sphincter ani was torn and powerless. He performed left anterior colotomy with the most excellent results. The purulent discharge ceased within fourteen days of the operation, and the patient began rapidly to gain in strength and weight. Other cases in which this treatment was successful are reported. One, a patient operated upon a year ago, had had, for some time, an enormous purulent discharge, which rapidly diminished after operation. In this case local treatment really did harm, for the introduction of bougies always caused a greater or less degree of peritonitis. There was a recto-vaginal fistula in Douglas's pouch, which he cured by the following operation: The mucous membrane of the vagina was freshened to a considerable extent around the fistula; the cervix was slit bilaterally, the posterior flap freshened, brought into contact with the freshened mucous membrane, and the two sutured together. The purulent discharge from the rectum continued, and colotomy had to be performed about a year after the first operation. On account of using a bad pessary there was a prolapse of the colon. This can be avoided, he says, by the use of a good rubber pessary. Three of his patients died within from eight months to two years and a half of intercurrent disease. In all three there was a marked bettering of the condition, both in regard to the lessening of the discharge, and general health. In none were there any good results from anti-syphilitic treatment. The local treatment was so directed that several injections of salicylic acid, thymol, permanganate of potash or alum were used daily, directed through the peripheral end of the colon by means of an irrigator. For this purpose the patients were placed upon a kind of injection bath, and the fluid injected through the peripheral end of the colon until it ran from the anus in a clear stream. After the first injections had been made and the fecal matter removed, there was a decided bettering of the purulent secretion. Two patients died several days after the operation, one of inanition because the operation was undertaken too late, the other of peritonitis.

On the day before the operation, a purgative is administered to the patient, and a few hours before the operation an enema is given. The operation is always performed in two stages. In the first the patient is chloroformed, the field of operation thoroughly disinfected, and an incision five or six cm. long is made parallel to and about half a centimeter above the outer portion of Poupart's ligament, so that one-half of the incision is above, the other half below the anterior superior spinous process of the ilium. The oblique and transversalis muscles are now cut through, and every bleeding vessel, even the smallest, is checked. The fascia transversalis and peritoneum are now incised. The parietal layer of the peritoneum is now stitched to the outer skin, and secured by button sutures. Catgut is used for this purpose, being carried through the skin, the whole muscular layer and the peritoneum, and the sutures drawn so that the whole wound is covered by a peritoneal layer, which will prevent extravasation into the subperitoneal tissue. The threads are then cut short. The thumb and index finger are now carried into the abdominal cavity, so as to get at the colon or the upper portion of the sigmoid flexure. The colon is easily recognized by the colic and epiploic ligaments. When the colon has been found it must be stitched with the parietal layer of the peritoneum, which has already been secured to the wound. This is done by means of a thin, slightly curved needle, carried in about one-fifth of an

inch between the visceral layer and the muscular structure of the intestine; then the needle is brought through the parietal layer about one-fifth of an inch from the edge of the wound, and out through the skin, and then the threads of carbolized silk are tied. In this manner surfaces of peritoneal tissue about one-fifth of an inch wide are brought together; after five or six days they become so closely adherent that there is no fear of their separation. Eight or ten sutures are put in place, and the threads left hanging out; this he considers as important, because after six days the colon and the whole wound become covered with granulations, and the colon cannot be certainly recognized. In one case, through the neglect of this precaution, the peritoneal cavity was opened during manipulation of the wound, and fatal peritonitis ensued.

By leaving the threads the situation of the colon can be easily determined when the time comes for opening the gut. This constitutes the second stage of the operation, and is generally performed six days after the first. This procedure being generally painless, the patient is not anaesthetized. The threads are pulled apart and cut in the middle until the mucous membrane of the gut is seen, or the colon is seized with two fine, sharp tenacula, and cut through between them. Tenacula are better than pincers, because when the intestinal wall is seized with sharp pincers a slight bleeding will ensue, which obscures the field of operation. If it is necessary to enlarge the wound into the gut, scissors may be used. After a few days the use of injections may be begun.

An accident which very often happens when the patient gets up is prolapse of the intestine. On this account it is of great importance not to make too large a wound, and, as soon as the patient gets up, to fit in a proper pessary. The air-filled rubber ring will be found very advantageous for this purpose.

As to the relative danger of anterior and posterior colotomy, Hahn gives the following reasons for preferring the anterior operation: 1. After anterior colotomy the patient can clean herself and make the injections without assistance. 2. The operation can be more easily and nicely performed. 3. Up to the second stage of the operation, or the formation of granulations in the wound, complete antiseptis can be more completely carried out.—*Langenbeck's Archiv*, Bd. xxix. Heft 2.

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Piece of Bone passed through the Bladder.

Mr. REGINALD HARRISON, at a late meeting of the Medical Society of London, described a case in which the lower epiphysis of a rabbit's femur passed from the bowel into the bladder, and thence per urethram. The gentleman, the subject of this condition, at first presented a tumour in the region of the fundus of the bladder, associated with vesical irritation and severe pain at the lower part of the abdomen. The urine contained pus. He was sounded, but nothing was detected in the bladder, and soothing treatment was adopted. A later examination of the urine showed the elements of feces, and air now escaped on micturition. One day he passed the piece of bone referred to, and subsequently the symptoms gradually subsided. For a long time his chief trouble was that, when the bowels were loose, fecal matter would block the urethra; but by the use of small doses of opium, regularly emptying the bladder with a soft catheter, and daily washing out, the fecal fistula gradually closed, and the patient was now in perfect health. If the above means had not succeeded, Mr. Harrison would have performed cystotomy in order to obtain perfect rest of the bladder. He had reason to believe, from abdominal examination, that the piece of bone was impacted in the transverse colon, which had then contracted adhesions with the bladder and opened into it, thus providing an exit for the foreign body, so unusual an occurrence that he could find only two similar cases on record.—*Lancet*, Nov. 17, 1883.

Resection of the Knee.

One of the most important contributions to practical surgery during the present year is an original memoir (*Revue de Chirurgie*, Nos. 4 and 5, 1883) by Professor OLLIER on resection of the knee, giving the results obtained from this operation in the surgical clinique of Lyons during the year 1882. He states that formerly he was opposed to this operation, and, on account of the high mortality—75 to 80 per cent.—which followed his first attempts, he thought it preferable, in cases not amenable to treatment by rest, drainage, and incision of abscesses, to have recourse to amputation in the thigh, the mortality of which operation in such cases was about 40 per cent. At the present day, however, owing to antiseptic dressings, the proportion is completely changed. Of seven cases in which resection of the knee has been recently performed by him, one only was fatal; and in this death occurred very soon after the operation, and was due to shock. The mortality of resection of the knee has thus been reduced from 80 to 14 per cent., and the motives which formerly induced the surgeon to abstain from performing this operation no longer exist. The use of Lister's dressings, with which M. Ollier associates iodoform, have completely changed the conditions of operative surgery in the clinique at Lyons. As an example of this, he states that, during the six months just previous to the date of his paper, he had performed twenty-two major operations (resections of large joints, amputation in the thigh and leg) without having had a single bad result through infection. Resection of the knee, which now, in M. Ollier's opinion, claims a place in the first rank of conservative operation, is applicable to three principal conditions: osteo-arthritis, or suppurative fungous arthritis; comminuted fracture, or gunshot wounds involving the joint; ankylosis in a bad position. Thus the resection may be pathological, traumatic, or orthopædic.

He does not approve of performing resection of the knee on children in whom osteo-arthritis usually yields to the expectant treatment, and the limb after the resection is likely to become very much reduced in length. He would not, therefore, practise the operation on any subject under the age of eight years and a half. In older patients, the indication for resection of the knee exists not only when the removal of the osseous extremities is absolutely necessary for the preservation of life, but is presented also when it is desirable to remove the source of a suppuration which, though not threatening to become immediately fatal, may prove so at any time, and which condemns the patient to long confinement in bed, and causes all the bad results of a chronic discharge. Formerly, it would have been more prudent under these conditions to undertake a natural cure; but now he holds, it would be blamable not to resect. The operation, when performed at a proper time, will prevent the dangers of articular suppuration, and enable the patient in the course of three or four months to leave his bed and to move about.

In performing resection of the knee, it has been M. Ollier's aim to place the parts in the best conditions for favouring osseous ankylosis, or obtaining a useful new joint in cases where solid union has not been established. Division of the ligaments and ablation of the capsule, as practised in the operations of Park and Moreau, is attended with the disadvantage of destroying the close relations of the osseous surfaces, and leaves the extremities of the bones quite loose in the wound, and deprived of such supporting soft structure as might assist very much in their ulterior union. By preserving the periosteo-capsular sheath, and maintaining the lateral and posterior continuity of this sheath, the surgeon may retain the ligamento-muscular girdle which surrounds the bones, and would keep them together after the operation. He advocates the subperiosteal method of resecting

the knee, but points out that this is not done with the view of forming a new joint. A solid limb is needed to support the weight of the body, and osseous union is the best guarantee against any relapse of the local disease. An H-shaped incision is made, which, however, is smaller than that that was formed by Moreau; on each side of the joint, is made an incision for free discharge, and for the insertion of drainage-tubes. The outer incision is made just in front of the tendon of the biceps, and the inner one just behind the tendon of the sartorius. In making the transverse incision, the ligamentum patellæ is cut through and the joint opened; the lateral ligaments of the knee are not divided. The superior flap is then raised together with the patella. If this bone be found diseased it is removed, its anterior covering of periosteum, together with the continuation of the tendon of the extensor muscles, being carefully preserved. The crucial ligaments having next been divided, the inferior extremity of the femur is projected through the wound and stripped of its periosteum, and the insertions of the ligaments, as far as the line to which it is thought necessary to apply the saw. The extremity of this bone having been removed in the usual way, the end of the tibia is dealt with in a like manner. All masses of thickened synovial membrane are scraped away, and the sawn surfaces of the bone brought together and fixed by two wire sutures. After the application of sutures to the edges of the skin flaps, the ends of the divided ligamentum being also brought together by suture, antiseptic dressings are applied, and the whole limb secured in a splint. This proceeding, Ollier asserts, not only seems to realize all the conditions required for total resection, but is applicable in its primary stage to exploratory arthrotomy, to articular scraping, and to superficial (intra-epiphyseal) and partial resections of the knee-joint. Under these circumstances, it is important to preserve the lateral ligaments and to re-establish the continuity of the quadriceps by suturing the ligamentum patellæ. The tendino-ligamentous girdle having been left intact, the elements of resistance and motility are preserved, and the joint is subjected but to the minimum of disturbance. He, however, would not at the present day compare these partial operations with total resection of the knee. The former are, in certain cases, rational operations, the dangers of which are much diminished by Lister's dressing and iodoform, but they are attended by the disadvantages of all operations that are too conservative—they expose the patient to the risk of relapse. The patella has always been removed by him; and it is considered prudent not to leave this bone in resection of the knee in the adult, when it is deprived of its cartilage and more or less diseased internally. This practice is a guarantee against relapse of osteitis and of fungous disease of synovial membrane. M. Ollier would not, however, adhere strictly to this rule, and thinks that the patella might well be left in cases of traumatic arthritis, particularly in infants. When this is done, it is necessary to increase the number of drainage-tubes. In preserving the patella when sound, in cases of some other lesion of the joint than osseous or synovial tuberculosis, the surgeon might gain the same advantages which he seeks to obtain by preserving the lateral ligaments and the capsule; that is to say, around the line of reunion of the bones there is an addition to the tissues, serving to augment the solidity of the limb. If firm union fail to be established between the bones, the presence of the patella would probably favour the compatibility of articular motility with usefulness of the limb.

In dealing with enlarged granular masses of synovial membrane in resection of the knee, the surgeon's practice should vary according to the nature of the arthritis. In articular disease of traumatic or rheumatic origin, these granular masses are converted into stable cicatricial tissue after the removal of their superficial layer, but in tubercular arthritis it is necessary to remove all the diseased synovial membrane and to apply the actual cautery to the raw surface. In cases

where well-marked gray granulations exist, and where large masses are observed of caseous material, or of pale and slightly vascular granulations extending under the periosteum, amputation is preferable to resection. Since the introduction of antiseptic dressings, the prospects of treating severe open injuries of the knee by resection have much improved; and, at the same time, these dressings, by preventing those bad results which resection is intended to remedy, are likely to diminish considerably the number of cases of resection, and to widen the field of non-operative conservative surgery. There will, however, always remain a certain number of cases of comminuted fracture of the epiphyses which should be treated by resection, as, for example, when the condyles are broken up into numerous fragments and a projectile or some other foreign body is present in the midst of the splinters. In a case of this kind, M. Ollier would perform the following operation, which he has not yet tried on the living subject, but which seems to possess several advantages on account of its simplicity and of its favourable anatomical conditions with regard to ulterior renewal of the joint if ankylosis should fail. This consists in a single straight median incision carried longitudinally over the patella and through the tendon of the quadriceps and the ligamentum patellæ, dividing these latter structures into two equal parts. The patella having been divided by a saw into lateral halves, the two lips of the wound are separated, the interior of the joint is exposed, and the extent and situation of the injury fully revealed. The surgeon is then able to do what is necessary, whether simply to remove splinters or foreign bodies, or to perform resection.

In two of the seven cases of resection of the knee recorded in this memoir, the operation was performed for osseous ankylosis. This condition had been the result in one of these instances of extension of inflammation from the juxta-epiphyseal region; in the second, of acute traumatic arthritis. In dealing with ankylosis of the knee by operation, the surgeon has hitherto had the choice of two methods of procedure: cuneiform excision of the femur above the articulation; resection of the osseous extremities which formerly constituted the joint. The second, he states, is that most frequently indicated, and is the only operation applicable in cases where the extremities of the bones are still diseased; where there are patches of osteo-myelitis in the condyles of the femur; and where open sinuses still exist and lead down between the bones. The operation of cuneiform excision of the femur may doubtless be often applied, but in cases where it is not necessary to interfere with the old joint, and where there is no diseased tissue to be removed, this cuneiform resection, in his opinion, should be replaced by a simple supracondyloid osteotomy, or better still by a bloodless operation, that is to say, by femoral osteoclasis. This supracondyloid fracture is with Ollier the "method of election," whenever such operation is applicable and especially in ankylosis of traumatic or rheumatic origin. In such cases, he would not hesitate to have recourse to osteoclasis, if the amount of flexion at the freed knee did not pass beyond a right angle. Osteotomy, it is allowed, has no great danger if performed antiseptically, but still it is not so harmless a proceeding as osteoclasis. That method should be chosen which enables the surgeon to obtain the same orthopædic result without a wound and yet with equal precision.

This memoir concludes with the following summary. 1. Antiseptic dressings have completely changed the indications and prognosis of resection of the knee. As formerly it was accounted wise and prudent to reject this operation, or at least to limit its indications in hospital practice, so now it would be considered unreasonable to continue to amputate the thigh in cases where resection is applicable. 2. In young subjects, on account of the dangers of resection with regard to ulterior lengthening of the bone, it is still necessary to insist on a methodical expectant treatment in suppuration of the knee, and on the employment of such

relatively simple means as arthrotomy, articular scraping, drainage, etc. The surgeon might have recourse in the place to these means at any age, but he should always prefer resection to amputation, except in dealing with severe forms of tubercular arthritis, for which the latter is the proper operation. 3. The gravity of resection of the knee is not greater at the present day than that of amputation through the thigh. The cases recorded in this memoir show that in resection of the knee success is now the rule where formerly it was the exception, and that the surgeon must be guided by other motives than the gravity of the operation in deciding between amputation and resection. 4. Endeavour should always be made to obtain osseous ankylosis after resection of the knee; but it is necessary in this operation to try to insure a strong articulation, in case, for some reason or other, ankylosis might fail. 5. The subperiosteal method allows the surgeon to attain this result. The sawn surfaces of the bones are thus left surrounded by abundant ossifiable tissue; and in cases where osseous union does not result, a complete ligamento-muscular girdle is preserved around the new joint. 6. From the scarcity of the observations that have hitherto been recorded, it is yet impossible to estimate the value of resection of the knee in military surgery. It may be presumed, however, that in future campaigns results may be obtained as good as those of modern civil surgery, if only the wounded can be treated with ordinary care. 7. In resection, a transverse incision is recommended together with two lateral vertical incisions. These incisions should not be so extensive as those that were made in Park's operation, and the lateral ligaments of the knee should be left intact. On each side of the joint, far back and near the posterior margins of the condyles, a deep vertical incision is made for the purpose of drainage. 8. In cases of chronic intra-articular suppuration, it is usually found necessary to remove the patella, its anterior covering of periosteum being preserved. The continuity of the ligamentum patellæ should be re-established by nature. 9. In the operative treatment of comminuted fracture of the articular extremities of the bones, a longitudinal incision is to be preferred to transverse incisions. A medium longitudinal incision in front of the knee, dividing the patella into two lateral halves, facilitates the operation, and preserves all the constituent elements of a new joint, and at the same time favours ankylosis, if this result be intended. 10. In osseous ankylosis of the knee, supracondyloid osteoclasts should be the method of election. This operation is especially applicable in cases of ankylosis of traumatic or rheumatic origin, when flexion does not reach or exceed a right angle, and when there are not any deep-seated and multiple cicatricial bands in the popliteal spaces. 11. Whenever there is a risk of lacerating any of the popliteal vessels or nerves inclosed in cicatricial tissue, it would be better to have recourse to supracondyloid osteotomy or to resection. It would be necessary in such case always to practise total resection of the condyloid expansions of the femur, if the cicatricial adhesions be deep-seated and multiple, and if the leg be flexed beyond a right angle. 12. Resection of the condyloid expansions is the only operation to be proposed when signs of inflammation of bone are presented. In a case of flexion of the leg passing beyond a right angle, the surgeon must remove not merely a wedge-shaped bone, but must take away some thickness of the posterior portion of the femur. This is the sole means of bringing the surfaces of section into contact, without exciting painful tension in the popliteal region and interfering with the circulation of the limb.—*London Med. Record*, Oct. 15, 1883.

OPHTHALMOLOGY AND OTOTOLOGY.

Treatment of Painful Corneal Ulcers by Warmth and Eserine.

In an introduction to a discussion at the Fifty-first Annual Meeting of the British Medical Association, Mr. CHARLES HIGGINS states that painful ulcers of the cornea are of very common occurrence amongst the debilitated and ill-fed people who make up a large proportion of hospital out-patients. Ulcers of the cornea, as is well known, are much more frequently met with among children than in adults; the phlyctenular ulcer being, perhaps, the most common form. It is not to these, however, that I wish to draw attention, but to the very painful serpiginous ulcers, sometimes known as marginal or crescentic, and the sloughing or suppurative ulcers of older persons.

The serpiginous ulcer is generally met with in feeble women rather past the middle of life. It commences as a thin ulcerated band near the margin of the cornea. The ulcer has a steep, cleanly cut, crescentic edge towards the centre of the cornea, and is flattened towards the corneal margin. The crescentic border gradually spreads over the surface of the cornea; but, as it advances, healing takes place behind it. The ulcer is accompanied by marked conjunctival and ciliary injection; and a network of very fine vessels follows it from the circumcorneal zone over the corneal surface. The ulcerated edge is preceded by infiltration and opacity of the cornea. The pain is very severe, and there is much photophobia. The ulceration rarely extends beyond the centre of the cornea, but may commence at more than one spot, and so implicate the greater part of it. It is extremely intractable and rebellious to treatment, but appears more amenable to that recommended in this paper than any other.

Sloughing and suppurative ulceration may arise spontaneously, or may be caused by injury, such as a sharp blow on the cornea from a rebounding twig or thorn, or any small foreign body. The ulcers form on any part of the cornea; we may meet with them as deep sloughy evacuations, or as collections of pus often having more the character of abscesses than ulcers, but which, sooner or later, burst externally or into the anterior chamber, leaving a ragged ulcerated cavity. This form of ulcer is often associated with hypopyon or onyx, and not unfrequently with abscess in the iris.

The treatment by warmth and eserine is very easily carried out. The patient is directed to foment the eye for fifteen or twenty minutes three or four times a day, or oftener. The fomentation should be used as hot as can be borne, and may consist of simple hot water, decoction of poppy-heads, or chamomiles. A solution of one or two grains of sulphate of eserine to an ounce of water should be dropped into the eye three or four times a day, after the fomentations have been used. A large pad of cotton-wool, thoroughly warmed before a fire or over a spirit-lamp, should be laid upon the closed eyelids, and secured by a bandage, and replaced by a freshly warmed one as often as may be necessary for the patient's comfort. The patient should be allowed to go about; dark rooms and confinement to the house always make matters worse. He should be well fed, purged, if necessary, and placed on some tonic, none being better than iron in some form or other. Stimulants are rarely needed, and in many cases will do harm.

The treatment by warmth without eserine is most useful in many painful inflammations of the eyes. It was first, I believe, recommended by Mr. Liebreich.—*Brit. Med. Journ.*, Nov. 3, 1883.

MIDWIFERY AND GYNÆCOLOGY.

Puerperal Eclampsia.

Dr. J. E. BURTON, after summarizing the views and facts regarding puerperal eclampsia, concludes:—

1. That puerperal eclampsia is a motor-neurosis associated with loss of consciousness.

2. That it stands in intimate relationship to the convulsions of childhood and to epilepsy.

3. That only one factor in its production is constant, viz: a peculiar condition of the nervous system that may be designated as one of "unstable equilibrium," and that this factor is common also to the convulsions of childhood and to epilepsy.

4. That retention of urinary constituents, when present, vastly increases the tendency to convulsions in pregnancy, but that outside the conditions of pregnancy and childhood such retention is but rarely the cause of convulsions.

5. That nerve irritation—shock, emotion, violent pain, uræmic or other morbid condition of blood, etc.—is capable of setting up sudden vaso-motor spasm of cerebral bloodvessels.

6. That this spasm of bloodvessels, causing sudden anæmia of the brain, is the cause of the convulsions, and, I would add, of the consequent coma.

Dr. Burton reports an interesting case in which he bled to $\frac{3}{4}$ viij, but with little effect. The patient remained comatose for three days and was thoroughly exhausted by the violence and long continuance of the convulsions. For three days she had had no food or medicine except by the rectum, for the coma was so deep that the reflex irritability of the palatal and pharyngeal muscles was absolutely lost. Whatever fluids were put into the mouth, no efforts of swallowing followed.

At this time he determined to inject some food into the stomach. He procured a No. 12 male catheter, and, by means of a piece of India-rubber tubing, attached it to a Higginson's syringe. He then mixed a breakfast-cupful of milk with an ounce of brandy, and about a drachm of Liebig's extract of beef. For an episcure such a compound would perhaps not be palatable, but it was not intended to touch the palate of the patient, so that the flavour was a matter of indifference. He then passed the catheter into the stomach and injected the whole of the mixture, with the comfortable feeling that at any rate the poor creature would not die of starvation. Within an hour consciousness returned, and from this time she was able to swallow. Her progress towards recovery was now uninterrupted.—*Liverpool Med.-Chir. Journ.*, July, 1883.

The Use and Abuse of Pessaries.

This subject has before now been discussed from the point of view of the proper selection of cases in which pessaries are or may be useful. The subject has various bearings. In the first place, the statistics of Vedeler and Herman show that anteflexion is more normal than any other condition in multiparous women, and that flexions, as flexions, do not, as a matter of fact, cause dysmenorrhœa. It is impossible to conclude that, if flexions do not cause the most direct of all uterine symptoms—dysmenorrhœa—they will cause the symptoms known as indirect or remote, for a test of which we refer our readers to the textbooks *passim*, and which include almost every ailment to which female flesh is heir. This being the case it follows that flexions, as flexions, should not be treated. But, secondly, we will suppose a typical case in which pessaries are known to do good—namely, more or less descent of the uterus, with or without

retroversion or retroflexion (which are most probably indications of descent), and we will suppose a pessary to be inserted—what amount of attention (*i. e.*, attendance) should this entail? Undoubtedly a woman wearing a pessary should not be sent away ignorant of its presence, and without any directions. She should, therefore, be informed, that such an instrument has been inserted; and she should be given certain directions. Thus, it is advisable at once to tell her that it is well to wash out the vagina once or twice a day with simple water, which will prevent secretions from accumulating, decomposing, and causing an unpleasant smell (which in some cases is bad enough to suggest the presence of cancer); she should also be told that soreness, itching, or profuse discharge indicates that the pessary should be seen to, and, generally, that it should not be worn without being seen to three or four times a year. It is also usually advisable that the doctor should satisfy himself in a week or so that the pessary is doing good, and doing no harm, and then, having once started the treatment, the patient should be left to test its efficacy. Now this test implies the removal of some symptoms or symptom, which may justly be attributed to some former morbid condition, and it also implies the locomotion of the patient. Generally speaking, a patient lying down is better without a pessary, whatever displacement is present; thus it is rare for even complete procidentia not to reduce itself, or become much smaller, when the patient lies down, and the symptoms of partial descent, which (if there are any symptoms at all) will include almost certainly a sense of weight and dragging pain in one or other iliac fossa, will disappear, or become greatly diminished, in the recumbent position. A pain which is better when the patient is standing and worse when she is lying, should be regarded with suspicion if supposed to be due to descent or displacement: it is probably nothing of the kind. Thus it is to relieve pains increased by standing that pessaries are most generally useful. If this is not effected, the uterus may be unquestionably in the "normal" position, but the pessary is useless, and, if useless, injurious.

Thus, the proper use of pessaries is first, in most cases, after the insertion of the pessary, to get the patient on her legs; secondly, to satisfy one's self in a few days that it is doing good and is doing no harm; but as soon as both these objects are attained, to send the patient away to test the treatment, with the above directions. It should not be the task of months to fit a woman with a pessary, any more than with a truss.

The following are *not* instances of the proper use of pessaries. To keep the patient in bed for long periods wearing a pessary; to see her every day, every other day, twice a week, for weeks, months, or years. Perhaps such visits are not made to the patient, but to the pessary. However that may be, it is not the pessary, but the patient, who has to pay. What should we say of a surgeon who called for months to see a patient to whom he had given a wooden leg or a truss, and who kept him in bed for long periods; or of an oculist who had fitted a patient with spectacles, and saw him every day for several months, whether the spectacles seemed to suit him or not? It is true that the pessary is a truss in the dark, but that is no reason why the management of a pessary should be a deed of darkness.

Recent investigations have shown that the whole question of displacements has to be reconsidered. It cannot be too widely or too dogmatically stated that prolonged treatment by pessaries, such as we have described, is quite inadmissible and unnecessary; and if unnecessary, injurious not only to the patient—*i. e.*, to her *morale* as well as her purse,—but also, in the best sense, to the practitioner, and if to the patient and the practitioner, then to the public and the profession. It should also be realized that a pessary is a mere form of truss, and that its operations, though removed from the general view, are not occult. All-treatment

bids fair to bring this useful form of truss into disrepute, and we are daily expecting to meet the practitioner whose sensitiveness is such that he shrinks from a cure whose name he has learnt to mistrust and dislike; but we feel bound to say we have not come across him yet.—*Lancet*, Nov. 10, 1883.

Castration for Uterine Fibroma.

Dr. WIEDOW, of Freiberg, read a paper on this subject in the Section of Gynæcology at the fifty-sixth deutschen Naturforscher versammlung, in September, 1883.

WIEDOW stated that the value of castration in these cases had been very differently estimated at different times. When this operation was first introduced, the enthusiasm was very great, and it was performed unnecessarily and in improper cases; consequently it fell somewhat into disrepute. He presented a short review of the cases which have been performed up to the present time. There have been 63 cases, of which 12 ended fatally. Hegar operated 21 times, 3 cases dying, giving a mortality of fourteen per cent. In one of his cases, the patient was very much better for six months, and the tumour had decreased, but then menorrhagia set in and at the same time fluctuation was detected in the tumour. The patient died a month later. The autopsy showed a fibro-cystic tumour, the lymph spaces of which were filled with purulent serum. In this case, as in one of Schröder's, the tumour again grew and became very large; the prognosis is unfavourable in these cases.

The results in the remainder of Hegar's 17 cases were very satisfactory. The menopause came on sooner or later, and the tumours decreased in size. Comparative drawings of the tumours before and after the operations were shown, and four of the patients were exhibited for examination. In reply to a question by Schatz as to whether the functions of the ovaries were not already lost, Wiedow stated that they were not.

Freund reported 6 cases operated on by him. The results were favourable; the tumours shrivelled, the bleeding ceased, returning in one case at intervals of four to five weeks. Only in one case was the result not good; in this a very large tumour developed.

Hegar does not so much consider the size of the tumours as the method of operating, and the dangers of one operation over another are to be carefully weighed. Castration seems to be the least dangerous, and the operation is to be recommended if the tumour is not yet of very large size. He remarked that, at the normal climacteric, there a cystic degeneration of very large fibromata may take place, or first shrinking and then subsequent growth, just as after castration. On this account he thinks the prognosis of castration for very voluminous tumours doubtful.—*Centralbl. f. Gynäk.*, Nov. 3, 1883.

The Vaginal Extirpation of Carcinoma of the Uterus.

At the late annual meeting of the British Medical Association, Prof. CARL SCHROEDER, of Berlin, read a paper on the subject, in which he said:—

The operative removal of cancer of the uterus is always indicated when it is thought possible to remove all the tissue involved by the neoplasm. If this seem possible, or even probable, the only reason for abstaining from the operation ought to be severe constitutional diseases threatening life in a measurable space of time, such as tuberculosis or Bright's disease.

The question whether it is possible to operate radically may sometimes be very difficult indeed to answer, and it would be illusion to suppose it possible to

decide it with the utmost certainty. It is possible, however, to distinguish under not too unfavourable circumstances, with perfect certainty, very small infiltrations, such as occur principally along the lymphatic vessels. For this purpose it is absolutely necessary to narcotize the patient, and to examine her in the dorsal position by the bimanual method. By pulling down the uterus with a volsella, and introducing two fingers into the rectum, the different organs of the pelvis and the pelvic cellular tissue are thoroughly investigated by letting the tissue pass, piece by piece, between the examining fingers. If the uterus be found to have lost its normal mobility, this must give rise to suspicion, although it may be the result of adhesive perimetritis. Hard infiltrations along the sides of the uterus, diminishing in thickness towards the broad ligaments, or small round nodules in the recto-uterine ligaments, are very characteristic of malignant infiltration. Finally, unusual inflation of the cervix shows that the neighbouring cellular tissue has already participated in the carcinomatous process. On the other hand, it is easy to decide by digital examination, as well as with the speculum, how far the neoplasm has extended on to the vagina.

A very important question is, how far up along the mucous membrane of the cervix, and of the corpus uteri, the carcinoma reaches. I believe that we can derive valuable information upon this point from the study of the form in which the neoplasm presents itself. For instance, in the most frequent form, canceroid of the vaginal portion (cauliflower-excrecence) we see these mucous membranes either not at all involved, or only involved at a very late stage of the disease. This is very characteristic, for we often find the canceroid extending far up into the wall of the cervix, excavating the tissue by ulceration, while a piece of the mucous membrane of the cervix, in a state of catarrhal inflammation, but not malignantly involved, hangs over the ulcerated cavity. On the contrary, the canceroid attacks first the mucous membrane of the vagina, next the pelvic cellular tissue, after that the tissue of the cervix, and finally the mucous membrane of the latter.

The second form in which carcinoma occurs, is the primary carcinoma of the cervical mucous membrane (encephaloid). It progresses just in the contrary order. Ulcerating first the wall of the cervix, and then that of the uterus, it extends relatively late beyond the external os on to the mucous membrane of the vagina, and on to the pelvic cellular tissue.

Between these two forms we must place primary cancer of the wall of the cervix (scirrhus). It involves, at an early period, the body of the uterus and the cellular tissue of the pelvis. Besides this, it often perforates through the top of the vaginal portion into the vagina, or towards the cervical canal, attacking the mucous membrane of the cervix very late. Canceroid of the vaginal portion thus leaves the uterine mucous membrane intact, while the cancer of the cervix spares, for a length of time, the pelvic cellular tissue. Besides these forms, the cancer is found primary on the mucous membrane of the body of the uterus, extending thence on to the cervix.

We now come to speak of the removal of the diseased parts. It is always possible to remove the uterus, even if the whole of this organ be diseased. The adjacent parts of the vagina can also be removed if they be involved. I have even performed total extirpation of the vagina successfully on account of superficial primary cancer of the vagina, although a recurrence followed later. Thus the possibility of removing even extensive parts of the vagina must be admitted. It is, however, another question whether it is advisable to undertake extirpation under such circumstances; for, where extensive parts of the vagina are attacked, the deeper tissue will always be found diseased, and the operation will, most probably, not be radical. Admitting that it is possible to

remove small nodules situated above the cervix, or behind the vaginal fornix, there will generally be more germs lying deeper; and to follow these up like the extirpation of the axillary glands after the amputation of the mamma, would be a matter of impossibility. Even when the infiltrated cellular tissue seems to be limited to the parts close to the cervix, an operation in healthy tissue will not be possible; for in pulling down the ulcerated cervix with the volsella, it will tear, and render the operation impracticable.

It is often possible, however, to remove canceroid of the vaginal portion radically, and, under favourable circumstances, also cancer of the wall of the cervix, if they be discovered at an early period. If they be found not to extend higher up than to the internal os, or a little further (for it is possible to perform partial excision above this point), supravaginal amputation can be performed. Cancer of the cervical mucous membrane, and of the body of the uterus, always necessitates total excision of the uterus.¹

The supravaginal amputation is performed in the following manner: A Museux's volsella is attached to each lip, and the uterus drawn firmly downwards. In some cases, it is then advisable to divide the cervix on both sides up to the vaginal fornix. The knife is now carried around the vaginal mucous membrane, dividing it all around in healthy tissue, and about one centimeter distance from the diseased parts. After this, I push the anterior vaginal fornix, and with it the bladder and its peritoneal duplicature, upwards above the level of the internal os. Then, always dragging the uterus firmly downwards, I cut off the anterior lip transversely, taking care to make the incision in healthy tissue. The hemorrhage is then arrested by suture, deep stitches being taken to unite the vaginal with the cervical mucous membrane, and these being pulled over the stump. The same proceeding is repeated with the posterior lip, during which manipulation the peritoneum of Douglas's pouch is generally torn. Finally, the bilateral incisions are closed, deep sutures uniting the fornix with the sides of the uterus.

Should it be necessary to perform total extirpation of the uterus, this is executed in the following manner: Two volsellæ are again applied to the lips; these pull the uterus as far down as possible. A circular incision is then made in healthy tissue around the cervix, and the vaginal mucous membrane pushed back and upwards, as in the previous operation. Next, Douglas's pouch is opened by a transverse incision, and the uterus is then turned over, so that its fundus appears in this opening. This is not always an easy manipulation. I generally first produce a retroflexion of the uterus, then catch the fundus with a volsella, and pull the body of the uterus through the incision in Douglas's pouch. After this has been done, it is easy to separate the peritoneum of the vesico-uterine pouch, leaving the uterus now only attached to the broad ligaments. These are ligatured either with a single ligature, or separately in different portions. Finally, the uterus is cut off close to its side, leaving a broad piece of tissue between the ligatures and this incision, in order to prevent the ligatures from slipping off, a most disagreeable event, which otherwise is likely to occur. After having performed this on one side, it is repeated on the other side in the same manner, this being generally much easier. The wound in the peritoneum is now closed. In stitching it, I generally attach the ligatured broad ligaments to the corners of the wound. They thus form two pedicles, turning their stumps outside, enabling me to stop any hemorrhage that might occur later on. Between

¹ In case of cancer of the uterus, complicated with prolapse, I only removed the body of the uterus, sparing the cervix, which was not diseased. The patient made a good recovery.

both stumps, I leave a small opening for a T-shaped drainage-tube, the end of which, protruding out of the introitus, is wrapped up in salicylated cotton. This cotton is removed as often as it is soaked; otherwise the patient is left quite to herself. The sutures are removed after a fortnight.

The technical execution of this operation is certainly not to be called easy. In order to perform it with skill, the operator must be accustomed to cervical operations, and to the manner of using the knife and ligatures in the depth of the vagina. Above all, it is necessary to take all the possible advantage of the mobility of the uterus, drawing it far down towards the introitus.

The principal danger of the operation consists in the ligatures slipping off the broad ligaments. It is then very difficult to stop the hemorrhage from the uterine or the spermatic arteries, for the stump generally retracts in such cases, and the blood flows upwards into the abdominal cavity.

The operation is very difficult when the vagina is narrow. Thus it is not easy to perform on nulliparæ, and is often impossible on very old women. Besides, it will scarcely be found possible to perform it when the uterus is very much enlarged; for instance, when it has reached the size of the pregnant uterus in the third month. In such cases, it may be necessary to perform Freund's operation—the total removal of the uterus by laparotomy; but this latter operation, as experience has shown, is much more dangerous than the excision through the vagina.

As to the success obtained by the vaginal extirpation, I must admit that it is not yet to be called satisfactory, especially as far as the question of recurrence is concerned. I have lost 7 out of 23 patients operated upon. This I consider a very bad result, for the operation, although a difficult and a dangerous one, ought to make us expect better results. We certainly may hope that it will follow the lead of the other large gynæcological operations, showing a better prognosis as fast as the technical methods become more perfect.

The supravaginal excision is much less dangerous. I have operated on 64 patients with 8 cases of death. Unfortunately, in a great number of my patients I have seen recurrence, in some cases after two or three years. Other cases have withdrawn from my observation, and only very few have remained until to-day quite without recurrence. This might also be a reason for discouraging us. We have, however, the consolation that the operation is performed according to correct principles, and that the prognosis will no doubt improve by and by, especially if the operation be performed early and radically. Besides, even if a recurrence take place, the patient suffers little towards the end of her life, compared with the dreadful suffering produced by ulcerating cancer, for the disease generally does not recur on the cicatrix in the vaginal fornix. It spreads upwards on to the pelvic cellular tissue, and saves the patient from the dreadful symptoms of cancer, from hemorrhage and ulceration. Let it thus be our object to endeavour to improve the prognosis of the operation, and let us bear in mind that the fate of these patients is such that, if only one out of twenty be radically cured, this ought to be considered as a good result, and as a consolation for many cases treated unsuccessfully.

Sir SPENCER WELLS (London) read a letter received from Professor Ols-hausen, recording modifications in the published description of his operations up to 1881. These consisted of not ligaturing the broad ligaments until late in the operation, and then using elastic ligatures, which prevented hemorrhage. The elastic ligature was applied by means of a bent aneurism-needle round the broad ligaments. It was essential to leave a considerable amount of cellular tissue to form a long stump, to prevent retraction and slipping off of the ligatures. The operation was performed under an irrigation of a two per cent. solution of car-

bolic acid. After the operation, Douglas's pouch was washed out with a four per cent. solution of boracic acid. A large drainage tube was introduced, the peritoneum being now stitched together. The vagina was packed with loose iodoform gauze. This gauze was generally removed between the fourth and eighth days, and the drainage-tube about the same time. The elastic ligatures, however, remained two or three weeks. This operation he deprecated when the uterus could not be drawn down as low as the vulva. He had performed, or attempted to perform, the operation twenty-eight times during the last two and a half years. In three cases, he had to be satisfied with the supravaginal operation; the patients recovered, but one had vesico-vaginal fistula. In the twenty-five remaining cases, the operation was completed; seven of the patients died: two on the day of operation; three of septicæmia on the second and third days; one of carbolic poisoning on the second day; and one of iodoform poisoning on the sixth day. Besides these, one died suddenly of embolism of the pulmonary artery on the twenty-sixth day. (A similar case had also recently occurred in his practice within the last few days, where he had performed myotomy.) Of the seventeen remaining cases: in two, no return took place for one year; in two, two years had elapsed without a return; in four or five, a recurrence had taken place. He then proceeded to criticize the operation, and to express a guarded opinion as to its desirability. In one case, he had removed the uterus in a pregnant woman; she lived only eighteen months. He called special attention to the danger of injury to the ureters, which appeared to have escaped in the mode adopted by the Germans, in pushing up and stripping with the finger the loose cellular tissue which surrounded the supravaginal portion of the cervix. Such success had not attended other operators. He strongly deprecated any one attempting the extirpation of the uterus, without previously performing the operation on the dead body.

Mr. KNOWSLEY THORNTON was profoundly disappointed with the results given by Schröder and Olshausen, who admitted a mortality of thirty-four and twenty-eight per cent. respectively, the results of the latter being made quite as bad as those of the former by the three incomplete operations, one of which had left the patient in miserable plight with an urinary fistula. In face of such mortality, he was not at all prepared to accept the dictum contained in the opening of Dr. Schröder's paper. It was true that the results of ovariectomy were as bad in the early days, but there could be no comparison between the two operations. Look at the number of patients restored to perfect health by ovariectomy, and look at the number dying miserably with recurrence shortly after extirpation of the cancerous uterus. Dr. Schröder said that, if one case in twenty could be cured, it was worth the general results. He could not agree with this; for what certainty was there that the one patient who was cured really had malignant disease at all? It was very difficult, in the epitheliomatous forms, to be quite certain, even after microscopic examination, that the disease was malignant; and he altogether distrusted examination by touch for defining the limits of the disease. It was well known to every microscopist how these malignant epitheliomata sent out long processes of cells into the neighbouring healthy tissues, often single rows, stretched for long distances up the lymphatics, far beyond the apparently diseased parts. The immediate results must be totally different from those at present obtained, and the after results also, before the operation could be admitted to a place among the legitimate operations in surgery. With present experience, he infinitely preferred the partial operations on the cervix, with the addition of the application of chloride of zinc. He was astonished to find Dr. Schröder placing the mortality of these operations so high; he had not operated very often, but he had never lost a patient, and several had had long

periods of freedom from recurrence. He believed that the operations for the complete extirpation of the cancerous uterus would soon drop out of surgical practice, as they had done in a past generation. The vaginal method appeared to be the best, but it was a poor best in immediate and after results, and usually necessitated leaving the tubes, or a great part of them, lest the pedicles on each side should slip; and what probability was there, that organs, so continuous in structure with the uterus as these were, would be free from the disease?—*British Med. Journ.*, Sept. 15, 1883.

Cancer of the Cervix and its Treatment.

Dr. A. WYNN WILLIAMS read a paper on this subject at the late meeting of the British Medical Association. There appears to him to be little or no difference between epithelioma of the cervix of the uterus and those forms of cancer known as medullary tumour growing from the same organ; the difference, if any, depending solely on the nature of the texture of the organ whence originating; the medullary tumour having its origin from the inner textures of the cervix; epithelioma, or the cauliflower growth, from its external covering.

Whenever we have any suspicion that such a disease as cancer exists, no time should be lost in ascertaining whether or not such is the case. Thus, whenever a patient complains of continuous pains in the back, extending down the thighs, especially the left, with irregular and profuse discharges from the uterus, together with discharges coming through the vagina, of a watery, sanious, and offensive character, she should be made to understand the absolute necessity there is to ascertain with certainty the nature of her malady, and of what vital importance it is to her, as the only hope of cure is in the early stage of the disease.

Whenever the disease has extended to the adjacent parts, such as the mucous membrane of the vagina proper, or to the neighbouring glands, or when the uterus is firmly fixed, you must not expect to do more than palliate the patient's sufferings; when, however, the uterus is partially fixed, without ulceration of the mucous membrane of the vagina, much may be done to prolong life.

When we have satisfied ourselves that a patient is suffering from cancer of the neck of the uterus, whether of an epitheliomatous or medullary character (practically there is no difference in the treatment), and the disease is confined to the uterus, we should proceed at once to get rid of as much of the diseased parts as is possible. This I do by means of the *écraseur*, cautery-knife, scoop, scissors, and scalpel; the patient reclining on her back, and under the influence of some anæsthetic.

In cases of epithelioma, or the cauliflower-growth, I remove the neck of the uterus with the *écraseur*, taking as much off as I possibly can without cutting into Douglas's pouch. Having done this, I introduce a large-sized speculum into the vagina, and apply the cautery to any bleeding points; removing at the same time, if necessary, with the cautery-knife, scissors, or scalpel, all diseased portions within reach—preferring the cautery-knife. I then apply a flat cautery freely to the whole of the raw surface, to prevent hemorrhage, and also for the purpose of causing a certain amount of slough. I then apply a plug of cotton-wool smeared over with a solution of perchloride of iron and glycerine, fill the vagina with cotton-wool, and apply a T-bandage. These plugs may be left in for two days, then removed, and the vagina syringed with a weak solution of tincture of iodine and water three or four times a day until the slough has separated. When this has taken place, I apply to any suspicious-looking part a strong spirituous solution of bromine (one drachm of bromine to three of spirit of wine), by means of a small pledget of cotton-wool. This is left in contact

with the wound for three or four hours. By this time, the bromine will have all evaporated. Care must be taken to prevent the contact of the bromine with the wall of the vagina, which is best done by thin pledgets of wool saturated with a solution of carbonate of soda. After passing down the speculum a plug of simple wool, I place over all a piece of gutta-percha tissue, made into the shape of a ball with cotton-wool.

The separation of the slough, or melting away of the diseased tissues, is not completed under a week or nine days. I may observe that bromine does not act as an ordinary escharotic by simply charring, but dissolves animal matter when saturated with it. Whilst this sloughing or melting is going on, the vagina is syringed out three or four times a day with a weak solution of the tincture of iodine. When this is completed, a solution of bromine is substituted; two or three drops of the strong solution to half a pint of water. This process must be repeated again and again until all vestige of the disease is removed.

In the medullary form of cancer the disease is not so easily diagnosed, or brought under the notice of the physician so early, as in the epithelial form, owing to the absence, in the early stage of the disease, of the peculiarly thin, watery, offensive discharge. The discharge is often supposed to be merely leucorrhœal, and the hemorrhage due to excess of menstruation. The physician is thus often not called in until the diseased mass is ulcerated and broken up into shreds. If a patient come to me when the disease exists only as a tumour in the neck of the uterus, I remove the neck of the uterus with the *écraseur*, and then dissect out any portion which might exist beyond the reach of the *écraseur*. It is truly marvellous what a quantity of diseased tissue may be removed from within the uterus without any serious loss of blood.

Having removed all diseased portions as far as practicable, I then treat the case in the usual way with bromine. Should the tumour be broken up into shreds, and the mucous membrane of the vagina be still unimplicated, the case should not be given up as hopeless. By careful manipulation with the instruments before mentioned, I have cut away such a large portion of the diseased tissues as has enabled me to apply the strong bromine solution with success. In many of these cases, again, they only come before us as the raw bleeding surface of a broken-up medullary or epitheliomatous tumour. Indeed, I am inclined to think that the so-called corroding ulcer is often nothing more. These ulcers are to be treated in the same manner as those caused by our own manipulations. Occasionally, when treating these cases, you will come on a hard solid portion. A few years ago, I was in the habit of injecting these with the bromine solution; but I rarely do this now, as it is not altogether unaccompanied by danger. I now proceed in a different manner. I pass a straight cautery-knife right through the hard mass; and, when the slough has separated, introduce a small pledget of cotton-wool saturated with the strong solution of bromine, or introduce it by means of cotton-wool wrapped round a vulcanite stem or sea-tangle. It is not very often that true scirrhus attacks the neck of the uterus; whenever it is met with, the tumour must either be injected with bromine or the neck of the uterus amputated, and then any stump that may be left treated with bromine in the usual way.—*British Medical Journ.*, Sept. 15, 1883.

HYGIENE.

Disinfection Regulations in Berlin.

In cases of variola, diphtheria, cholera, and typhic affections energetic disinfection is necessary. It is equally obligatory, but not necessarily so rigid in scarlatina, dysentery, and measles. It may be necessary in certain cases of whooping-cough, tuberculosis, contagious inflammations of the lungs and eyes, glanders, charbon, hydrophobia, puerperal diseases, and wound complications.

Means of Disinfection.—The disinfecting means are: 1. Washing with lye-soap, prepared by dissolving 3iiss of black soap in ten quarts of tepid water. 2. Carbolic acid, one part to twenty of tepid water, well shaken. 3. Corrosive sublimate. This is only employed in the more contagious diseases, and the prescription for its use should be given by the physician. The strength of the solution should be 1-1500. 4. Carbolic-acid spray. The solution for this purpose should be 1-20. 5. Chlorine gas—made by pouring hydrochloric acid on chloride of lime, equal parts; 1bij 3viij of chloride of lime is necessary for the disinfection of a large room. 6. Ventilation, obtained by opening the doors and windows and fireplaces. 7. Dry heat and steam. These means can only be used in special establishments. When these do not exist, the same effects may be obtained by the use of chlorine gas. After the use of this gas, the various articles should be exposed to the air for a time. 8. Burning is the best disinfectant for articles of little value.

Disinfection of Rooms—(a) *Apartments still Furnished.*—1. At the beginning of the disease special care should be taken that only absolutely necessary articles of furniture should be kept in the room; all clothing except that in use by the patient at the time should be removed from the room, and no linen which has been worn by the patient should be used by any other person. 2. All articles used by the patient, and capable of being washed, should be placed without shaking or brushing in the solution of soap already mentioned, which should be situated in the patient's bedroom. 3. All bandages and dressings should be burned and the instruments disinfected with carbolic acid. 4. Except in special cases, indicated further on, all excretions from the patient should be received in vessels containing constantly the lye-soap solution, and thrown as soon as possible into the water-closet. If the pôts de chambre become soiled they should be scoured with the lye-soap solution. 5. Bad odours should be treated by good ventilation, and not by fumigations and deodorizers, or else by taking pains to prevent them altogether. 6. No food should be kept or prepared, nor should any one eat or drink, in the sick-room. On leaving the room, the attendants should wash themselves thoroughly, scour the beard, and brush the clothes with carbolic-acid solution.

(b) *Rules for Transporting the Patient and his Clothing.*—1. When it is necessary to carry the patient to a hospital, on account of variola, cholera, or typhus fever, it must be done through the sanitary police. Public carriages shall not be used for this purpose. When a case is made known, disinfecting measures must be resorted to at once. Before the removal, the patient and his clothing should be disinfected by means of the carbolic acid spray. 2. After recovery, the patient should be placed in a bath, and, if possible, thoroughly washed with lye-soap solution; then with a large quantity of tepid water, and clothed. The clothing which has remained in the chamber during the period of sickness should be exposed to chlorine gas before they are again worn, and the room should be thoroughly disinfected. 3. The bodies of persons dead of a contagious disease must be removed as soon as possible; where the patient has died of variola,

diphtheria, typhus fever, or cholera, he should be wrapped in cloths impregnated and wet with a solution of corrosive sublimate, 1-1500. For other diseases, the shroud should be wetted with the lye-soap solution. If a cadaver remains for more than twenty-four hours in the house, the abdomen should be covered with a piece of cloth impregnated with chloride of lime, 1-5, in order to prevent any disagreeable odour.

(c) *Rules regarding the Clothing, etc., surrounding the Patient.*—1. Before sending to the laundry the clothing, bed-linen, and articles which can be washed, they should be wrapped, without shaking or brushing, in cloths impregnated with a solution of corrosive sublimate, and boiled for half an hour in the lye-soap solution, if death was caused by variola, diphtheria, cholera, typhus fever, charbon, glanders, or hydrophobia. When death has been caused by other diseases, it is sufficient to wrap the articles in cloths soaked in the lye-soap solution, and then to wash them in hot water as soon as possible.

2. Articles which cannot be washed, such as the beds, pillows, mattresses, bed-coverings, draperies, and carpets, must be covered with cloths impregnated with corrosive sublimate, after cases of any of the above-mentioned diseases, and disinfected by dry heat or steam. Mattresses and pillows must be opened, in order that their contents may be purified; if of but little value, they must be burned. After other diseases, it is sufficient to wrap these articles in cloths soaked in the soap solution, and then expose them to dry heat. Leather articles should be treated successively with the soap solution and carbolic acid. Detritus and remains of all kinds should be burned.

(d) *Disinfection of Evacuated Apartments.*—1. In variola always, and in scarlatina and varioloid when the police order, the floors, walls, windows, doors, furniture, and utensils of all kinds must be scoured with sponges or brushes wet with corrosive sublimate solution, and immediately afterward everything must be washed with the soap solution. After other diseases the black-soap solution may be used instead of corrosive sublimate. It is sufficient to rub decorated walls with a wet sponge.

2. After each object has been treated in the above-described manner, chlorine gas should be disengaged in the room—vessels containing the mixture from which this gas is disengaged should be placed on some high object on account of the density of the gas. During this process the doors and windows should be tightly closed. Metallic objects should be protected from the action of the chlorine by a coating of oil or varnish. The apartment should remain closed for twelve hours, after which cloths wet with ammonia should be hung in the room, in order to neutralize the chlorine gas which does not pass out when the windows are opened.

(e) *Special Directions.*—1. Variola is especially transmitted by the secretions from the skin of the patient, and as much by the linen and clothes as by the emanations which the attendants respire. All the rules for disinfection should, therefore, be exactly carried out.

2. Diphtheria is generally transmitted by the sputa of the patient, received on handkerchiefs, or falling on the bedclothes or directly on the attendants. Special attention should, therefore, be paid to this mode of transmission of the disease, and to the rules laid down for these cases. The urine should be received into vessels containing carbolic acid solution.

3. The manner in which cholera is conveyed is not certainly known. It is quite certain, however, that in certain cases the disease is conveyed by the intestinal discharges. Rooms occupied by cholera patients should be thoroughly ventilated and subjected, for several days, to carbolic-acid vapours. Especial care should be taken that no one eats or drinks in the room, and that no food is placed

therein. The directions for disinfecting articles of clothing, etc., have already been given. The evacuations should be received into vessels half filled with a solution of corrosive sublimate solution. Cholera patients should not use water-closets; but, if this has been done, the closet should be thoroughly disinfected, and the seat thoroughly washed with a strong disinfecting solution.

4. Both typhoid and typhus fever may be transmitted from the patient to the attendants. In typhus fever very free ventilation is necessary, and sprays should be used several times a day. The stools should be received into vessels half filled with carbolic-acid solution. Typhic patients should not be permitted to use water-closets; when they do use them the closets should be disinfected.

5. Scarletina is but little contagious to adults and children who have already had the disease. It is, on the contrary, dangerous for pregnant women. The urine should be received in a vessel half filled with carbolic-acid solution.

6. Measles is very contagious for children, less for adults. Ventilation is very important; when not practicable, the spray should be used.

7. As stated above, precautions must be used with the linen soiled by dysenteric patients; their stools should be received in carbolic-acid solution as already described. The patients should not be allowed to use the water-closets; if they do, however, the closets should be disinfected as above.

8. The virus of charbon and glanders from man is not so virulent as that from animals; nevertheless, special attention should be paid to the dressings and instruments. There are no special indications for hydrophobia.

9. Objects contaminated by the sputa of persons sick of pertussis, tuberculosis, or other contagious inflammations of the lungs, should be disinfected with particular care; if it is difficult to obtain good ventilation, the carbolic spray should be used. In cases of contagious ophthalmia, all bandages, compresses, handkerchiefs, sponges, etc. should be carefully disinfected.

10. Rules for disinfection of lying-in women, and those attacked by or attendant on puerperal fever, may be gathered from the foregoing.

11. Patients suffering with wound diseases should be isolated as much as possible. The dressings should be burned when they are of no value. Instruments and utensils used should be placed in a 1 to 30 carbolic-acid solution, and the dressers should wash their hands with soap and carbolic-acid water after attending to the case.—*Union Méd. du Nord-Est*, October 15, 1883.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Ptomaines, or Cadaveric Alkaloids.

MR. R. N. WOLFENDEN gives the following *résumé* of the facts concerning the ptomaines:—

Though the term “ptomaine” was first applied by Selmi to these bodies to indicate that they were of cadaveric origin, their distribution is no longer to be limited to the cadaver, but investigations are rendering it more and more probable that alkaloids of a poisonous nature occur in certain pathological conditions, and possibly also normally, as a product of change of living tissue. Selmi’s first observations were made on corpses dead of arsenical poisoning, and it is of interest to refer to his methods. The liquid under observation was made alkaline with baryta water, and then extracted with ether; acicular crystals were produced, which precipitated the principal reagents that alkaloids answer to, with

the exception of platinum chloride. Selmi's second attempt was made by extracting the liquid with aqueous alcohol, then making alkaline with baryta, shaking with ether, ridding of the ether by spontaneous evaporation and distillation, treating the turbid liquid thus left by water acidulated with acetic acid, filtering and evaporating to dryness; then taking up the residue with water, again rendering alkaline with baryta and extracting with ether, and repeating the process till the liquid became colourless. The alkaloid thus extracted was so strongly poisonous as to destroy frogs with the greatest rapidity. Both of these extracts were free from arsenic. Subsequently Selmi extracted from the stomach of a hog which had been kept on arsenious acid a compound of an alkaloid (ptomaine) and arsenic, of an intensely poisonous nature, and resembling very much the vegetal alkaloid strychnia. As to their manner of production, Selmi supposed them to be products of putrefaction of organized nitrogenous material. They are variable in their nature according to the length of time after death, and though not present within a few hours after death in any appreciable quantity, they slowly develop with advancing decomposition. Indeed, it is only with extreme difficulty that in medico-legal cases they can be distinguished from true vegetal alkaloids, if the post-mortem examination be delayed; but probably, if made within twenty-four to forty-eight hours after death, any alkaloid found then will be a vegetal and not a cadaveric one. In general these ptomaines are oftenest amorphous in form and alkaline in reaction. They are for the most part volatile and easily alterable. They form crystalline salts with acids as a rule. The addition of acids to them usually changes them, with the production of pleasant odours, like orange-flower, musk, etc. Allowed to oxidize by contact with atmospheric air, they emit disagreeable cadaveric or urinous odours.

Some of these ptomaines are not poisonous, but most possess strongly toxic characters, and cause profound symptoms when injected under the skin—such as paralysis, more or less complete, of hinder extremities, dilatation of pupils, convulsions, muscular flaccidity, slowing or acceleration of the heart, loss of cutaneous sensibility and of muscular contractility, possessing many of the characteristic physiological actions of muscarin or atropin. They answer to nearly the same reactions as the vegetal alkaloids, some being precipitated by platinic chloride, gold chloride, mercuric chloride, or tannic acid, etc.; and all have a strongly reducing action on potash ferridecyanide. They yield colour reactions with sulphuric acid (red), iodic acid and sulphuric acid (violet), nitric acid (yellow), etc. Their physiological properties are really their only characteristic properties, distinguishing them from other alkaloids. These ptomaines are met with under the following conditions:—

1. *As a Constituent of Normal Tissues or Juices*—In this case they are products of tissue metamorphosis (a) If from twenty to thirty cubic centimeters of fresh saliva be taken and evaporated over a water-bath to dryness, and the residue extracted with boiling water and finally filtered, a toxic substance is obtained, which is strongly reducing, and converts ferridecyanide of potash, along with one or two drops of ferrichloride, into "Prussian blue." Injected into the thigh of a frog with a Pravaz syringe, it kills the animal in a longer or shorter time. (b) Snake poison differs from human saliva only in the intensity of its action. Gautier has extracted from the poison of *trigonocephalus* and *naja* two distinct alkaloids, and a third which resembles either an alkaloid or an albuminous compound. (c) From normal urine Gautier asserts to have obtained a fixed oxidizable alkaloid, which forms a crystalline chloride, and also a crystalline double salt with platinic and gold chloride. This alkaloid is very poisonous, killing quickly with systolic standstill of the heart, stupor, and paralysis. Though

Gautier's facts are unquestionable, there is a fallacy underlying his explanation of them that renders it valueless.

2. *In certain pathological conditions*, recent observations of Selmi's on what he calls pathological basis would seem to show: (a) In the urines of patients suffering from progressive paralysis there are two volatile bases: the one like nicotin, the other like coniin. (b) In the urine voided during a case of interstitial pneumonia were two alkaloidal bases: one having the odour of stinking fish, the other of ammonia. (c) Two similar bases were found in the urine of patients with abdominal typhus. (d) In tetanus a base like coniin was discovered in the urine. (e) In the urine of "miliary fever" an alkaloidal base having the odour of stinking fish has been observed.

3. *As a Cadaveric or Artificial Production.*—There can be no further doubt that these bodies are largely produced in the process of decomposition of nitrogenous or proteid tissues. Since Selmi first described their production his facts have been abundantly confirmed and extended. There are many varieties of them, and they vary much in their nature, according as the length of time after death is long or short. They are, however, of slow production naturally, a point referred to before, and to be borne in mind in conducting medico-legal inquiries. Stinking fish, bad meat, etc., all contain poisonous principles which can be extracted after the manner of ptomaines. The gastro-intestinal irritation and profound toxic symptoms produced by the ingestion of bad food are probably at the bottom processes of alkaloidal poisoning. On this subject I shall have more to say on another occasion. It is even possible that many so-called uræmic phenomena are produced by the retention within the body of these alkaloidal poisons; and, further, that the products of gastric digestion contain poisonous properties which, imperfectly excreted, may become toxic. There is a statement by Balduino Bocci that normal urine, especially after meal times, if injected into frogs, destroys them rapidly. The observation of Gautier that an alkaloid of highly poisonous nature is to be obtained from normal human urine is of importance with reference to this point.

Brieger has obtained by the decomposition of neurin final products of trimethylamine, and a volatile body giving the iodoform reaction, which he suggests may be identical with those volatile substances in urine which give the iodoform reaction. By decomposition of neurin and albumen toxic bodies may be obtained much resembling muscarin. Both from freshly prepared peptone made by the action of gastric juice on pure fibrin, and from stinking peptone by boiling with caustic soda, evaporating, extracting, and purifying, toxic alkaloids can be obtained which kill frogs and rabbits in a few minutes. Putrefying casein, brain substance, liver, and muscle also yield these products. In the laboratory I have confirmed the observations of others as to the production of these substances, and I have also confirmed the statement of Gautier as to the production of a toxic principle from ordinary fresh saliva, which are very destructive to small animals. The extension of these observations to the investigation of snake poison and the salivary poisons of certain animals in the pathological state (rabies, etc.) becomes of extreme import. The investigations of Weir Mitchell on the production of snake poison are of extreme interest in connection with this point, indicating, as they do, the discovery of three toxic principles in serpent's venom: the one resembling a peptone, the other a globulin, and the third serum albumen.

Some of these ptomaines are poisonous, some non-poisonous; and it is common to find a poisonous and a non-poisonous moiety linked together. Some are volatile and crystalline, others non-volatile and non-crystalline, some precipitated by ether from acid or alkaline solutions, and some only precipitated by amyl, alcohol, or chloroform. With regard to tests, they answer to many of those

usually employed for vegetal alkaloids, giving a dark colour with tannin, a thick yellow precipitate with potash cadmium iodide or potasso-mercuric iodide, with cadmium or bismuth iodide a red precipitate, with gold a mercuric chloride, a precipitate, and some of them precipitating platonic chloride. The vast majority are strongly reducing. This fact was put forward by Brouardel and Boutmy as a distinctive test for the presence of ptomaines. The base extracted from the body is converted into a sulphate, and to a little put into a watch-glass which contains ferridecyanide of potash a few drops of ferric chloride are added. If a ptomaine be present there is a reduction of the ferridecyanide and the formation of Prussian blue. Brouardel and Boutmy asserted this reaction to be given only by ptomaines, morphia, and perhaps veratria, and to be in a manner characteristic. It has since been proved by Tauret, Gautier, and others that many vegetal alkaloids yield this test (aconite, digitaline, ergotinine, hyoscyamine, etc.), and also many artificial alkaloids (aniline, methylaniline, phenylamine, collidine, etc.). Even gelatine solutions and solutions of extract of meat give this Prussian blue reaction, so that it cannot for an instant be taken as characteristic of the ptomaines. No chemical test has as yet been devised that is at all crucial, and the general reactions, taken along with their physiological peculiarities alone, can be taken as evidence of the presence of a ptomaine.

The ptomaines so far described are: 1. Ptomaines, like atropin and hyoscyamine (Sonnenschein and Quelzer), crystalline, and which dilate the pupil and accelerate the heart. They are obtained from putrescent albuminous fluids. 2. An alkaloid from decomposing yeast (Schmiedeberg and Bergmann), which the authors call sepsin, and which resembles strychnia. 3. An alkaloid resembling morphia in its tests, but not in its physiological properties (Selmi). 4. One agreeing with delphinin, and which by warming with phosphoric acid gives a red colour. It does not agree physiologically. 5. One resembling strychnia in its behaviour towards sulphuric acid and potash bichromate, but not causing tetanus (Ciotto). 6. Alkaloids like muscarin (Gautier, Brieger, etc.). 7. Alkaloids like coniin, colourless, leaving a sharp taste like tobacco, and consisting of a poisonous and non-poisonous moiety, one part volatile the other non-volatile; one soluble and precipitated by warmth, like coniin, the other not. 8. Alkaloids resembling parvolin and hydrocollidin (Gautier and Stard), and one like collodin (Neucki).

As to the manner of production of these bodies chemically, I do not propose here to enter. It could only at present be speculative. I would sum up briefly as follows:—

1. There are developed in the body, post-mortem, poisons of an alkaloidal character, and which can be obtained also by decomposition of albumen, peptone, casein, muscle, brain, etc. Moreover, they seem to be present in some normal secretions (saliva and urine).

2. These cadaveric alkaloids may be mistaken, post-mortem, for vegetal poisons administered with evil intent; but if the body be examined within from twenty-four to forty-eight hours after death, any alkaloid there found would be strong presumptive evidence of poison, and not ptomaine. After a couple of days it may be a matter of doubt.

3. There is no satisfactory test surely indicating the presence of a ptomaine. Physiological characters must be taken in conjunction with chemical tests.

4. Probably the production of ptomaines within the living body may be the pathological cause of many obscure conditions, especially those following on poisoning by bad food, such as stale fish, etc.—*Lancet*, Nov. 17, 1883.

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TO READERS AND CORRESPONDENTS.

ALL communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favouring us with their communications are considered to be bound in honour to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of May.

Liberal compensation is made for all articles used. Extra copies, in pamphlet form with cover, will be furnished to authors in lieu of compensation, *provided the request for them be made at the time the communication is sent to the Editor.*

The following works have been received for review:—

Klinische Vorträge aus dem Gebiete der Geburtshilfe und Gynäcologie auf Grundlage eigener anatomischer und klinischer Beobachtungen. Herausgegeben von J. BALANDIN, Director des Hebammeninstitutes in St. Petersburg. I. Heft. (Mit. XII. Lithographischen und 1 phototypischen Tafel.) St. Petersburg: C. Ricker. 1883.

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A Case of Severe Purulent Inflammation of the Middle Ear, with Restoration of the Drumhead. Consecutive Dentalgia without Caries. By EDWARD S. PECK, M.A., M.D., etc. New York.

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Alienist and Neurologist. American Druggist. American Journal of Insanity. American Journal of Neurology and Psychiatry. American Journal of Obstetrics. American Journal of Pharmacy. American Journal of Science. American Journal of Dental Science. American Medical Digest. American Practitioner. Analectic. Archives of Medicine. Archives of Ophthalmology. Archives of Otology. Archives of Pediatrics. Atlanta Medical and Surgical Journal. Boston Medical and Surgical Journal. Boston Journal of Chemistry. Buffalo Medical and Surgical Journal. Chicago Medical Journal and Examiner. Cincinnati Lancet and Clinic. Cincinnati Medical News. College and Clinical Record. Columbus Medical Journal. Dental Cosmos. Denver Medical Times. Detroit Lancet. Druggists' Circular. Ephemeris of Materia Medica, Pharmacy, and Therapeutics. Fort Wayne Journal of Medical Sciences. Gaillard's Medical Journal. Half-Yearly Compendium of Medical Science. Iowa State Medical Reporter. Journal of American Medical Association. Journal of Cutaneous and Venereal Diseases. Journal of the Franklin Institute. Journal of Nervous and Mental Diseases. Independent Practitioner. Kansas City Medical Record. Kansas Medical Index. Louisville Medical News. Maryland Medical Journal. Medical Age. Medical Herald. Medical Annals. Medical News. Medical and Surgical Reporter. Medical Record. Mississippi Valley Medical Monthly. Nashville Journal of Medicine and Surgery. New Medical Era and Sanitarian. New Orleans Medical and Surgical Journal. New York Medical Journal. North Carolina Medical Journal. Obstetric Gazette. Pacific Medical and Surgical Journal. Popular Science Monthly. Philadelphia Medical Times. Rocky Mountain Medical Times. Physician and Surgeon. San Francisco Western Lancet. Sanitarian. Sanitary Inquiries. Sanitary News. Southern Practitioner. Southern Medical Record. St. Louis Courier of Medicine. St. Louis Medical and Surgical Journal. Texas Courier Record. The Polyclinic. Therapeutic Gazette. Virginia Medical Monthly. Weekly Medical Review. Canadian Practitioner. Canada Lancet. Canada Medical Record. Canada Medical and Surgical Journal. L'Union Médicale de Canada.

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2. Fourth Annual Report of the State Board of Health, Lunacy, and Charity of Massachusetts, 1883. Supplement containing Report and Papers on Public Health. Boston. Pamphlet, pp. 260.
3. Eleventh Annual Report of the Board of Health of the City of Boston. Boston, 1883. Pp. 108, pamphlet.
4. Report of the Board of Health of the State of Louisiana for the Year 1882 and First Six Months of 1883, with numerous Tables, Lithographic and Chromo-Lithographic Plates. Baton Rouge, 1883. Pamphlet, pp. 637.
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ARTICLE I.

ARTERIO-VEINUS ANEURISM OF THE COMMON CAROTID ARTERY AND INTERNAL JUGULAR VEIN, WITH A CASE. By LEWIS A. STIMSON, M.D., Surgeon to the Bellevue and Presbyterian Hospitals; and Professor of Clinical Surgery in the University of the City of New York.

PHILIP McM., 25 years old, a butcher by occupation, was admitted into Bellevue Hospital, in August, 1883, a rather small, but naturally muscular and robust man, with a markedly nervous and excitable temperament, and plainly showing the effects of prolonged indulgence in alcoholic drinks.

In February, 1882, he was stabbed in the neck on the left side with a penknife at a point now marked by a small scar half an inch behind the anterior margin of the sterno-cleido-mastoid, and on a level with the crico-thyroid space. Bleeding from the wound was profuse for about two hours, then ceased spontaneously, and the wound healed in a week without other treatment than that which he himself gave it. During this week the neck on the wounded side was much swollen, and there was at times much difficulty in breathing; the corresponding side of the face was œdematous. The swelling gradually diminished, and disappeared entirely, he thinks, in the course of two months.

Early in the following June, after a spree, a lump as large as a hen's egg formed at the seat of the wound, the cheek and neck again became swollen, and the difficulty in breathing recurred. He then consulted a physician, who called his attention particularly to a whirring sensation felt in the neck, which he had himself noticed for some time, but had thought nothing of. The lump and the other symptoms, except the thrill, disappeared, and in August he resumed work, but as the work caused the choking sensation, accompanied by dizziness, to return, he again abandoned it.

To what extent the injury enforced idleness, or whether it was not simply an acceptable excuse for self-indulgence, cannot now be determined, but it appears that since that time he has done no work, and has at times, perhaps persistently, been drinking heavily. He alleges discouragement as an excuse for his conduct, saying that during the year he consulted many physicians, became thoroughly acquainted (too much so, he thinks) with the nature of his injury, and was uniformly advised to seek no operation for its relief.

On admission to Bellevue Hospital, eighteen months after the infliction of the wound, he was tremulous and distinctly alcoholic, and complained of nausea and gastric distress, of occasional choking, vertigo, some dimness of vision in the left eye, and dulness of hearing in the left ear. The last two symptoms were not confirmed by appropriate tests, and the first were thought to be due to alcoholism. The statements concerning the choking and vertigo probably shared the exaggeration that marked his account of other symptoms.

On the left side of his neck, in the position above described, is a non-adherent linear scar half an inch long. A very distinct thrill could be felt on the left antero-lateral region of the neck between the clavicle and the ear, with a loud buzzing sound strongly reinforced during the systole of the heart. The thrill was recognizable by the slightest touch, and could be arrested by firm pressure at the scar or on the line of the carotid below it. Pulsation was barely perceptible in the left facial artery, easily recognized in the left temporal artery, and was of the usual force in the corresponding arteries on the right side. No recognizable dilatation of the veins. Pupils equal and normally responsive. There seemed to be a slight deep swelling or thickening in front of the great vessels near the scar.

The symptoms and history clearly indicated the existence of a traumatic communication between a large artery and vein, and, together with the position of the scar, left no doubt in my mind that the artery was the common carotid, and the vein the internal jugular; and, as the vein overlies the artery completely on this side, I think the point of the knife must have passed completely through the vein, perforating it at two points, and punctured the adjoining wall of the artery. As there was no recognizable tumour, I inferred that there was no aneurismal sac intermediate between the vessels, but that their walls were in contact, and that the blood passed directly from the artery into the vein. The absence of recognizable dilatation of the veins and of symptoms indicating obstruction to the venous flow is to be explained by the ease with which the blood passes from the internal jugular to the heart, and perhaps also indicates that the opening in the artery was small. The history of a previous tumour and swelling indicates that the blood must at one time have escaped quite freely into the surrounding tissue.

After having kept the man under observation for more than a month, and having sought and received the counsel of several colleagues, I determined to operate. The controlling reasons for this decision were the man's alleged inability to work, about which some doubt might be felt, and

his moral decadence, about which there was none. As to the first, he persisted in his assertions, after having been warned of their importance in determining the question of interference; and while it is probable that a man of stronger will and steadier nerves would, under similar circumstances, be able to regulate his life accordingly and earn a livelihood in spite of the infirmity, I think corroboration of this patient's sincerity is found in his persistent search for relief in the face of all the advice to the contrary which he had received.

As to the second reason, it may be claimed that his moral regeneration was a task belonging rather to the professional teacher of morals than to the surgeon, but it seemed to me that the latter might fairly deem himself under a professional obligation to remove an apparent obstacle that stood in the way. And while a successful result is by no means always a justification of the propriety of the interference which led to it, it carries the advantage of allowing that propriety to be called in question without exciting those painful regrets which arise from a consciousness of harm done through an error in judgment.

A decision as to the details of the operation was also reached with some difficulty, partly because of doubt as to the extent to which the tissues about the seat of injury had undergone change. The point of communication between the two vessels appeared to be not more than three-fourths of an inch below the bifurcation of the artery, and perhaps not more than half an inch, and therefore the application of a ligature to the common trunk on the distal side of the opening, in addition to the necessary one on the proximal side, seemed too hazardous to be undertaken. The alternative of placing the second ligature upon the internal carotid, with or without a third upon the external carotid, was also rejected, and I determined to tie the artery at one point only, and that as near to the opening on the proximal side as possible, hoping either that the distal clot would extend far enough to close the opening, or that the reverse current through the internal and external carotid would prove too slight to cause inconvenience.

The operation was done October 8th. The vessel was approached above the omo-hyoid, but as the tissues immediately overlying it were found thickened and condensed, the incision was extended downward, and the artery tied below the muscle. It was necessary to divide one of the inferior thyroid veins between two ligatures in order to expose the artery. The ligature was of stout catgut (E violin string), prepared by soaking in oil of juniper and keeping in alcohol. The wound was frequently irrigated during the operation with a solution of salicylic and boracic acid, 1 and 6 parts respectively in 500 of water, and at the last was washed with carbolic acid, 1 in 20. A rather short drainage tube was inserted, and the incision closed with catgut sutures. Carbolyzed gauze dressings were applied so as to fill the normal depressions and make snug pressure.

The left side of the face was cool and pale during the afternoon, but had recovered its colour and temperature the next morning, and except for some nausea the man was then comfortable and his condition natural.

During the first six days the temperature did not rise above $99\frac{3}{4}^{\circ}$. The dressing was changed for the first time on the 14th day, and the wound was then found perfectly dry and healed throughout, even over the drainage-tube which had slipped in. Two stitches were cut, and the edges of the wound separated for about an inch to remove the tube. On the 7th day, the temperature rose in the afternoon to $102\frac{1}{4}^{\circ}$, fell the next morning to $98\frac{1}{2}^{\circ}$, and after rising again the following afternoon to $100\frac{1}{4}^{\circ}$ remained below 99° . Oct. 17th there remained only a small dry scab at the seat of the drainage tube, and the dressing was discontinued.

The thrill ceased entirely when the ligature was tied, but at the first change of dressing, on the 4th day, it was again present, though with greatly diminished force and recognizable only on deep pressure with the finger over a small area about the opening; it increased somewhat in area and force during the next few days. On the evening of the 10th day the patient was awakened by an attack of dyspnoea with precordial distress and pain, and was much frightened; he received some morphine subcutaneously, soon went quietly to sleep, and awoke the next day free from all the unpleasant symptoms. I suspected the cause of this attack to be a pulmonary embolus, either a portion of the distal arterial clot broken off and washed through the opening into the vein, or a portion formed in the vein by growth through the opening. But as the patient was quite hysterical during the following fortnight, and made frequent complaint of pain behind the lower part of the sternum and in the epigastrium, the diagnosis remains in doubt. There can be little doubt about a second accident which occurred on the 15th day, when he noticed in the morning a little dizziness and a slight loss of power in the right hand; the pupils were equal and normal, and there were no other paralyses. The symptoms, which were probably due to a small cerebral embolus, disappeared within an hour or two, and have not recurred.

The thrill is now, seven weeks after the operation, recognizable only over the seat of the opening, and can be arrested by moderately firm pressure at that point, or by deep pressure behind the angle of the jaw; it is steady and continuous. The portion of the anterior temporal artery visible on the side of the forehead is notably enlarged, and pulsates strongly; its pulsation is arrested by distal pressure.

I have found nine similar cases recorded or mentioned, together with three of traumatic communication between the internal carotid and internal jugular, and six between the external carotid and a vein in the neck.

I. COMMON CAROTID AND INTERNAL JUGULAR.

1. Reported by Marx in *Mém de l'Acad. de Méd.*, 1833, vol. iii. p. 233. A man forty-three years old who, twenty years before, had received in a duel a sabre-wound in the right side of the neck just above the inner end of the clavicle. The wound was half an inch long, and bled profusely; he arrested the bleeding by pressure with his handkerchief, and went alone and on foot to the hospital, a distance of two miles. In five days the wound was healed, and he left the hospital. He suffered no further inconvenience from it. At the time of the report, twenty years later, there was still a thrill with peculiar bruit, arrested by pressure on the line of the carotid $1\frac{1}{2}$ inches above the scar.

2. Mentioned briefly by Lefort in *Dict. Encyclopédique*, Art. Carotide, p. 644. A soldier received a sabre-cut in a duel; the bleeding was arrested by pressure. A large tumour formed with a peculiar thrill perceptible between the clavicle and ear, and with a bellows-murmur. He left the hospital on the 45th day, the tumour having shrunk to the size of a small nut. The scantiness of the details leaves some doubt as to the exact nature of this injury.

3. Larrey, *Clinique Chirurg.*, vol. iii., 1829, p. 149. A soldier, forty-one years old, received a sabre-cut on the right side of the neck just above the sterno-clavicular joint. The hemorrhage was so free that it placed the man's life in immediate peril; it was arrested by bandaging, and the patient was brought to the hospital. There was a large tumour under the wound, and pulsation in, and dilatation of, the external jugular vein; thrill. The wound was half an inch long, and divided the inner portion of the sterno-cleido-mastoid muscle. The tumour disappeared entirely about the 60th day; the thrill and bruit persisted. The man returned to duty. Larrey thought the artery was wounded near its origin, and that both sides of the vein were perforated.

4. Larrey, *loc. cit.*, p. 154. A soldier, thirty-seven years old, was wounded in the lower right side of the neck while fencing with a comrade. The wound was small, and the bleeding slight; there was an ovoid aneurismal tumour under the wound with thrill and bruit. Dismissed cured in two months, the thrill persisting. Both these cases were treated by the continuous application of ice.

5. *Allgemeine med. Zeitung*, April, 1833; abstract in *Arch. Gén. de Méd.*, 1834, 2d ser. vol. iv. p. 135. A student was wounded in a duel in March, 1833, the narrow blade of the sword penetrating to a distance of three inches downwards and inwards; the external wound was one inch below (?) the middle of the right clavicle, or a little nearer its sternal end. Only a few drops of blood escaped. A large tumour immediately formed above the clavicle; the patient fainted, and had tetanic convulsions and dyspnoea, which were relieved by free venesection. The next day the tumour pulsed with "a peculiar sound like that of a liquid escaping through a narrow orifice;" three weeks later the tumour was reduced to the size of a hen's egg, pulsation and bruit persisting. Eight months afterwards the bruit could be heard only over the point of communication between the vessels, and the tumour could be entirely reduced by a full inspiration. The patient considered himself entirely well, and was leading a very gay life.

6. *Pennsylvania Hosp. Reports*, vol. i. p. 195, and Norris in *Amer. Journ. Med. Sci.*, 1847, vol. xl. p. 13. A coloured seaman, 59 years old, admitted April, 1836, with a "traumatic varicose aneurism" on the right side, for which the carotid was tied by Randolph a month later. He died, comatose, the next day. (The record on the Hospital books, for a copy of which I am indebted to the kindness of Mr. Cadbury, the steward, is even more brief, and speaks of it as "aneurism of the carotid.")

7. Dr. David Prince, *U. S. Sanitary Com. Surg. Mem.*, vol. i. p. 147. Soldier; 20 years old; pistol shot in left side of neck, one inch from median line at the level of the larynx; not much bleeding. Eighth day, swelling less, very distinct thrill, perceptible to touch, and loud whizzing murmur heard through stethoscope; slight bleeding occurred in the evening. Ninth day, common carotid tied; patient remained stupid and drowsy most of the time for nearly five days, and then died. On the third day symptoms of partial paralysis of sensation and motions in the right extremities were observed, and twelve hours before death "a sweat came upon the right half of the body and *not* upon the left." The autopsy showed that the bullet had notched the artery on its outer side at the bifurcation, and had perforated the internal jugular vein. There was no distinct aneurismal sac, no clot in the distal portion of the carotid. The corpus callosum and optic thalamus seemed softer on the left than on the right side. "Nothing abnormal was found elsewhere."

8. Verneuil, *Bull. de la Soc. de Chirurgie*, second series, 1870, vol. x. p. 487. A man, 40 years old, received a pistol-shot wound in the right side of the neck, two centimeters below the bifurcation of the carotid, and midway the width of the sterno-cleido-mastoid. Bleeding was slight. The next day the neck was slightly and uniformly swollen, with intense thrill and very loud double bellows murmur or spinning-wheel sound, perceptible over an area two inches wide, and extending from the mastoid process to the clavicle, but with their maximum at the seat of the wound. Pulsation equal in the temporal arteries; continuous application of ice. On the ninth day the wound was almost entirely healed, the swelling had subsided; the thrill and murmur persisted with the same intensity, but had not been noticed by the patient.

9. Maclean,¹ in *Perrin's Journ. of Med.*, Detroit, 1875, xi. p. 261. "Pistol-shot wound from above, penetrating neck on left side. Healed. Distinct buzzing sound continued over seat of wound. Health good. No aneurismal sac at seat of injury. Arterial pulsation synchronous with beat of heart. Diagnosis: Arterio-venous aneurism of common carotid and internal jugular, or one of the inferior thyroid veins."

10. The one above reported.

To this series may be added a case, apparently unique, of supposed non-traumatic communication between the common carotid and the internal jugular, reported in the *London Med. Gazette*, 1842, vol. xxxi. p. 107.

A woman, 66 years old, with a large, pulsating tumour on the right side of the neck, extending from left sterno-clavicular joint to middle of right clavicle, and up to the right ear. The body of the tumour is firm and somewhat lobulated. There is a projecting portion as large as a hen's egg near the ear, which is "soft, movable, easily emptied, and has a strong vibratory motion. To the outside of this projection the integuments have a very distinct vibratory motion, as if a small bird or insect were fluttering strongly under them. . . . Pulsation and bellows murmur throughout the whole tumour, but over the projection and portion of integument just alluded to the sound is very loud, whizzing, and like that of an old-fashioned spinning-wheel." The carotid artery and a very large vein, thought to be the internal jugular, could be distinctly traced along the upper half of the outer side of the tumour. Pressure on the side of the tumour or on this vein arrested or diminished the thrill and sound. The patient said the tumour had begun thirty years before at the lower part of the neck, and had gradually enlarged. The soft portion appeared six years before this examination, after vomiting and coughing. [Nine years afterwards the patient was alive and the tumour unchanged.]

II. INTERNAL CAROTID AND JUGULAR VEIN.

1. Duval, *Arch. de Méd. Nav.*, Paris, 1864, i. p. 413. "Stab-wound behind left ear. Frightful hemorrhage; general tumefaction with thrill and indistinct sounds. Under treatment, tumour diminished and wound healed completely. Diagnosis: Arterio-venous aneurism of the internal carotid and jugular. A year later the wound reopened, hemorrhage returned, characteristic sound slowly diminished."

2. Joret, *Gaz. Méd. de Paris*, 1840, 2d ser., vol. viii. p. 457. A man, 35 years old, wounded in a duel, the ball entering on the right side of the face, traversing the nostrils and upper part of the pharynx, and penetrating again behind the left tonsil. Free hemorrhage. The patient was apparently well after a month, with the exception of much headache and strabismus. Four months after the injury an attack of aphasia, from which he recovered; during the following two years his mind weakened, he had epileptiform attacks, and died about thirty months after the injury. The ball was found lodged in the left internal jugular behind the angle of the jaw. At the upper portion of the internal carotid was an aneurism as large as a pigeon's egg, communicating also with the internal jugular. The portion of this vein between the ball and the heart was normal; the wall of its distal portion was so thickened that it could hardly be distinguished from the artery. Two foci of softening in the brain, and two small cerebral veins distended to form pouches one-third of an inch in diameter, and filled with clots.

During the latter part of the patient's life there was a pulsating swelling behind the ramus of the left jaw, with the "murmur pathognomonic of varicose aneurism;" there was also projection of the left eye.

¹ For this abstract and four of the following (Mazzoni, Queirel, Duval, and Desparanches) I am indebted to the kindness of Dr. J. S. Billings, of the Library of the Surgeon-General's Office, Washington.

3. Giraldes, *Bull. de la Soc. Anat.*, 1854, vol. xxix. p. 298. A man, wounded by a single bird-shot in the right side of the neck, just below the angle of the jaw. This was immediately followed by diffuse swelling of the right side of the neck, with characteristic thrill and double murmur. A month after the accident the swelling and ecchymosis had disappeared, leaving a small pulsating tumour. An operation was proposed and declined, and the patient left the hospital. He returned shortly afterwards with malignant anthrax, and died.

The autopsy showed an aneurismal sac as large as the end of the little finger, lying between and communicating with the internal carotid and jugular, and containing the small shot. The opening into the carotid was a short distance above the bifurcation, and was as large as a crow's quill; the opening into the vein was a little smaller.

III. EXTERNAL CAROTID AND EXTERNAL JUGULAR.

In some of the following cases doubt must be felt as to the identity of the vessels involved.

1 Desparanches, *Journ. Gén. de Méd. Chir. et Pharm.*, Paris, 1819, vol. lxvii. p. 202. "Stab in neck. Arterio-venous aneurism of left external carotid and jugular vein. Usual sound as above described. Slight symptoms of paralysis of the corresponding arm. Eight months later man seen in same condition.

2. Queirel, *Mars. Méd.*, 1872, vol. ix. p. 354. "Sailor, 40 years of age, large tumour over external jugular vein, slightly pulsating. Auscultation *souffle à double courant*. No serious inconvenience."

3. Holston, *Western Lancet*, April, 1856, p. 199. The patient was a man 50 years old, who, fifteen or twenty years before, had received a charge of bird-shot in his neck, followed by the formation of a small pulsating tumour which caused no trouble except "throbbing, which extended to his brain, and often confused his mind." Within two years the tumour had become much larger "The vein [which ?] also increased in size, and the thrilling sensation extended downward to the breast, as well as upward to the head. The eye on that side [apparently the right side] inflamed, and its sight became impaired, the hearing was also nearly lost on that side. Memory was much weakened, and he laboured under constant and considerable confusion of mind." The aneurismal tumour was on a level with the larynx, as large as a hulled walnut, and pulsated; the facial vein formed a bunch as large as an egg at the angle of the jaw; the external jugular was tortuous and as thick as the forefinger. The carotid was tied below the omo-hyoid; the patient was comatose the next morning, and died fifty-five hours after operation.

4. Mazzoni, *Clin. Chir.*, Rome, 1876, iii. p. 138. "Woman, 24 years of age. A month previous had received a cut in the neck; wound slight; healed rapidly. A continued bellows-sound producing great discomfort brought her to the clinic. Cicatrix three centimeters long. Placing hand on tumour a thrill and pulsation corresponding to beat of heart was observed, with loud bellows-sound. On pressure of carotid pulsation in tumour ceased. Diagnosis: Arterio-venous aneurism of external carotid and jugular. Compression made constantly three days and nights unsuccessfully. Tumour was laid bare, and common carotid tied. On tenth day after operation hemorrhage commenced, and continued during two or three days; it was thought to come from the superior thyroid, which was tied. Transfusion of blood. Died on twelfth day, exsanguinated."

5. Ruz, *Bull. de l'Acad. de Méd.*, Paris, 1838-9, vol. iii. p. 278. A man, 38 years old, who, fourteen years before, had been struck on the left side of the head with a bottle; a fine linear cicatrix in front of the ear. Several tumours, evidently formed by the dilatation of veins, occupy the left side of the cheek and head; the largest and lowest extends from the tragus to the angle of the jaw, and forward to the anterior border of the masseter; they are soft, subcutaneous, evidently filled with liquid; the overlying skin shows no change in colour, but is much distended. An aneurismal thrill is easily recognized, by ear and finger, in each tumour, and is most marked in the largest. Pressure on the carotid arrests the thrill, and the tumours shrink. The left eye is prominent, and the veins of its conjunctiva varicose.

6. Parkman, *Am. Journ. Med. Sci.*, April, 1853, p. 370. A man, 35 years of age, who, at the age of 11, was struck within the right ear with a small chisel. Profuse bleeding. The external jugular vein is enlarged throughout its whole length to diameter of two inches; some slight enlargement of the veins of the temple. In front of the ear there is very strong pulsation with loud, purring thrill. There had been no change in the condition for many years, and the patient did not desire treatment.

Of the nineteen patients, eighteen were males, one a woman; a disproportion which is readily explained by the traumatic character of the cause. In ten cases the cause was a stab-wound (five with a sword, four with a knife, one with a small chisel), in four a pistol-shot wound, in two a wound by bird-shot, in one a blow with a bottle, in two unknown.

Excluding for the moment from consideration those cases in which the external jugular vein or its immediate branches were directly involved, the attention is arrested by the absence of those changes which are so prominent a feature when a similar communication between an artery and a vein occurs in other regions of the body, and which cause so much discomfort and even disability. These changes, as is well known, are a marked and often irregular dilatation of the veins, not only near the point of communication, but also in the distant branches on the distal side, interference with the distal flow, and the usual formation of an aneurismal sac with the usual tendency to increase in size.

The cause of these changes is the increase of the pressure within the veins, produced by the passage into them of the arterial blood. Normally the pressure of the blood in the distal veins of the extremities is slight, seldom exceeding that of a column of mercury half an inch high, and the venous flow in them is carried on by a *vis a tergo* communicated through the capillaries, aided by such other influences as the pressure of the contracting muscles, the changing position of the limbs, and the suction exerted by the thorax during inspiration. The numerous valves placed along the course of the veins preserve each advance as it is gained, and protect the underlying branches from the extension to them of accidental temporary increase of pressure in the trunks above.

When arterial blood passes directly from an artery into a corresponding vein, it does so under a pressure that is far in excess of that previously existing in the vein; it cannot escape toward the heart without lifting and rapidly pushing before it the venous column on the proximal side, without, in other words, exerting a pressure much in excess of the normal venous pressure, and this pressure must of course be equally exerted in an opposite, distal, direction, and laterally upon the wall of the vein. Under this increased pressure the wall yields, and the lumen of the vein enlarges; so long as the distal valves remain sufficient this pressure is not transmitted to the veins beyond them, but the passage of the blood through the latter is obstructed by the obstacle thus placed before it; when, however, the valves yield under the pressure or become insufficient by the enlargement of the vein, the pressure is transmitted from above to the

segments thus deprived of protection, and the same changes occur in turn in them. The extent of the change depends upon the size of the opening in the artery and the relative amount of the blood which escapes from it; when that opening is large, as, for example, when the artery is cut completely across, all or nearly all of the arterial blood makes its way into the vein, and may even reverse the current in the distal segment of the latter, and make its way back to the heart with difficulty through the branches and their anastomoses.

The essential cause, therefore, of the changes which make the injury so serious is the pressure of confined blood within organs incapable of resisting it, the tension of a quantity of blood which is pressed upon strongly from behind by the arterial column, and escapes with difficulty through the vein. The amount of pressure varies directly with the insufficiency of the means of escape, and the changes in the walls of the veins vary with this pressure.

But when the communication is between the common carotid and the internal jugular, the conditions are very different. Here the venous current is habitually aided, not opposed, by gravity, and instead of being pushed forward by a *vis a tergo* it is drawn along by a *vis a fronte*, the strong suction of the chest during each inspiration, and the feebler one of the elastic return of the lung upon itself during expiration. Instead of being distended the wall of the vein is habitually flaccid, and the pressure within it is *nil* or even negative. In addition, its lumen is very large and it communicates within a short distance with other trunks as large and even larger than itself, in which also the pressure is negative and into which, therefore, any temporary excess of blood will readily escape.

If the opening from one vessel into the other is not direct, if, in other words, there is an intermediate aneurismal sac, this sac is not large and does not grow larger as a similar one does which communicates with an artery alone. In the latter case the sac pulsates and enlarges because the pressure in it corresponds to that within the artery, rising and falling with it through a range on either side of the mean arterial pressure; and the constant action of this pressure gradually distends the wall of the sac.

But when the sac communicates also with the vein, the average pressure is less, and the same maximum is never reached, because the incoming blood is no longer confined, but escapes into the vein as readily as it enters from the artery, and is thus prevented from exerting a distending pressure upon the wall of the sac. The change, therefore, when once fairly established has no tendency to increase.

When, however, the external jugular vein is directly involved the conditions more nearly resemble those found in other parts of the body. The escape of the blood through the vein to the heart is not entirely free, and hence the distal flow is obstructed. The effects of this obstruction are shown very clearly in Ruzf's case (III. 5), where a series of tumours de-

creasing in size from below upward formed along the veins of the cheek, forehead, and scalp, tumours formed by dilatation of the veins. In the other cases of the same group the aneurismal tumour was large, or the external jugular notably dilated. In two of them, Holston's and Mazzoni's, the discomforts thus produced were so great that an operation was undertaken.

In one of the three cases in which the internal carotid was the artery injured (Joret's, II. 2), in which the opening was above the angle of the jaw, and in which the flow through the internal jugular was obstructed by a pistol-ball lodged in the vein on the proximal side of the opening, changes due to the obstruction took place in the veins within the cranium, and death followed two years after the injury in consequence of these changes and apparently also of cerebral emboli originating in the associated aneurismal sac. The presence of an aneurismal sac in this case supports the explanation above given of its absence in the others, because in this one the conservative condition of free venous flow toward the heart did not exist.

Another feature of much interest is the facility with which hemorrhage was arrested and the external wound healed. In the absence of other statistics showing how frequently men have perished by primary hemorrhage after a wound of both these vessels, it would be improper to infer that recovery is the rule or even frequent. It is well known, however, that death by hemorrhage is common after wound of the artery alone, and it may, I think, be plausibly maintained that the additional wound of the vein is a favourable condition, and diminishes the risks arising from the wound of the artery. And this, for the same reason that makes the later changes less serious, the free escape of the effused blood into the vein and thence back to the heart. When the artery alone is wounded, the blood, if its immediate escape through the external wound is prevented by the shifting of the latter's walls or by dressings, infiltrates and presses back the surrounding tissues until it forms a collection the tension of which is approximately equal to that of the blood within the artery; and under the influence of this tension, the external wound reopens and the hemorrhage recurs. When, on the other hand, there is also an opening into the vein, the effused blood is drawn into it by the thoracic suction and forced in by its own pressure, and thus the collection is kept small and its tension too low to force the edges of the external wound apart. At each beat of the heart as much blood comes from the artery as if it alone were divided, but the patient does not lose it, it is simply turned back again to the heart; a portion of the stream is withdrawn for a moment from the vessels and then returned to them, *auto-refusion*. And as regards the distal circulation in the corresponding territory there is no more change than, indeed not so much as, if a ligature had been placed upon the artery.

The course of the affection in the principal group of cases, after it had

become established, was eminently benign; that in the group in which the external jugular was involved less so, and it was complicated also by the presence of venous tumours immediately under the skin which threatened by their liability to injury.

Of the ten cases of the common carotid and the three of the internal carotid, one (Joret's) died two years after the injury, and apparently of cerebral lesions arising from it; one (Prince's) was operated upon on the ninth day, and died of the operation; one (Giraldes's) died of an intercurrent disease shortly after recovery from the wound; of one (Randolph's) no details are known, except that an operation was considered necessary, and he died in consequence. The others, nine in number, recovered easily from the injury, and, with the single exception of mine, appear to have suffered no inconvenience from the persisting lesion; the history of one of them covers a period of twenty years subsequent to the injury, that of the others varying periods counted only by months.

Of the six cases in which the external jugular vein was involved, in one (Desparanches's) details are lacking; in another (Mazzoni's) so much discomfort was caused by the throbbing that the patient sought relief by operation one month after the injury, and died. In one (Holston's) occasional mental confusion was caused during fifteen or twenty years, then the tumour grew larger and the symptoms more marked; relief by operation was sought, and the patient died. In two (Rufz's and Parkman's), covering periods of fourteen and twenty-four years respectively, the patients suffered no inconvenience, and declined operation. In the remaining one (Queirel's) there was "no serious inconvenience."

The mortality, four deaths in five operations, is vastly in excess of that of the same operation, ligature of the common carotid, under other circumstances. One of the deaths was due to a cause, secondary hemorrhage, which is always liable to occur, and which excites no comment except upon its rarity. The causes in the other cases are obscure or unknown; one of the patients died within twenty-four hours after the operation, another in fifty-five hours, the third on the fifth day. Concerning the first there are no details except that the patient died comatose, and Norris, in his table of operations upon the arteries prepared more than ten years afterwards, gives "congestion of the brain" as the cause. The second patient (Holston's) became comatose during the night following the operation, and remained so until death, partial hemiplegia on the opposite side occurring meanwhile. In the third case (Prince's) the patient remained stupid and drowsy until death on the fifth day, and in him also symptoms of paralysis on the opposite side promptly appeared; the patient was operated upon on the ninth day after the receipt of the injury, no clot was found in the distal portion of the artery, and the surgeon attributed death to acute anæmia of the brain. Concerning the previous history of the first of these three nothing is known; the second,

after many years of comparative immunity, presented before the operation cerebral symptoms which may have had another cause, and which were rapidly increasing in severity. There is a free field for speculation as to the probable periods of survival if the operations had not been done, but it cannot be doubted that the operations were the immediate cause of death.

No other treatment seems to have been employed in any case except Mazzoni's, in which compression was tried for three days before resort was had to operation. In my case the patient could hardly bear momentary pressure sufficiently firm to arrest the thrill.

Finally, if a case should again arise in which an operation might be deemed necessary, what should the operation be? The experience gained in operations for the relief of arterio-venous aneurisms in other parts of the body cannot be wholly relied upon to guide us in a choice, because of the differences in the conditions present and in the objects to be attained.

The anatomical conditions peremptorily exclude all those operative methods in which the sac is opened; and equally of course no one would think of tying both the artery and vein above and below the point of communication. There remains, then, only ligation of the artery on one or on both sides of the opening. (In *recent* cases pressure, if it could be borne, and if the proximity of the pneumogastric nerve did not prevent, might work a cure as it has done elsewhere.)

A guide in making the choice is to be found in the object to be attained. This object is not, as it is so frequently elsewhere, to secure the obliteration of an aneurismal sac which disables by its size and threatens by its steady growth, and into which it is unwise to allow any arterial blood to continue to enter, but it is merely to diminish the amount of the blood which escapes from the artery, to reduce it to that which can be readily carried away by the vein. This is an end with which the surgeon may well be content, even while recognizing that there is a superior one; for while it falls short of completeness, its shortcoming will probably cause no disability, no weakness, its lack of perfection does not make itself obtrusively manifest, and, if need be, the second step that leads to a complete shutting off of the stream can be subsequently taken without additional difficulty or danger.

Judged by the standard so neatly formulated by Verneuil, "*l'efficacité, la b nignit , la facilit *," proximal ligation of the artery seems to deserve the choice. It may be less efficacious, but it is also less dangerous and easier of execution than double ligation, and it offers the chance not only of reducing the evil to a degree at which it can be well borne, but even of curing it entirely by the growth of the distal clot within the artery. This clot may be fairly expected to extend to the opening, which takes the place of the first collateral branch so much insisted upon in operations

upon vessels, and it is quite within the range of possibility that it should overlap or plug it.

A second ligature upon the distal side of the common trunk, or upon the internal carotid if there should not be sufficient room upon the other, doubles some of the risks by doubling the operation, and increases the probability of the occurrence of cerebral embolism or of a thrombus extending into the cerebral arteries. On the other hand, it is to be said in its favour that by preventing a recurrent stream through the internal carotid it prevents the withdrawal, before distribution, of a portion of the blood carried to the brain by the arteries of the other side, and thus diminishes the chance of the occurrence of dangerous acute cerebral anæmia. This chance must exist, though to a less degree, in all ligations of the common carotid, the blood passing down the internal to be distributed through the external carotid; but, judged at least by the operations of the last ten or fifteen years, it is not a very serious one, and it might be made still less by pressure on the internal carotid for a few hours after the operation.

When the communication is between the external carotid or one of its branches and the external jugular the conditions are less simple, and so varied that the choice of an operation must vary with them. These cases have more in common with arterio-venous aneurism of the extremities, and the general principles of treatment are more nearly the same. So far as they can be formulated for the latter, they suggest the ligature of all vessels entering or leaving the sac so far as this can be done without opening it, but such a plan should certainly not be carried out in its entirety if the external jugular is dilated throughout its course to the extent noted in some of the cases here mentioned. As the diameter of the external carotid artery is comparatively small, it is more likely that the vessel will be completely divided in the original injury, and this is still more true of its branches; and the well-established tendency of the distal portion to become occluded under such circumstances would, I think, justify the surgeon in limiting his operation to the placing of a single ligature on the proximal side, and of course on the wounded artery, if practicable, rather than on the common carotid. The number, size, and free inosculations of the veins of the region are such that an attempt to secure all the afferent ones would be bloody, dangerous, and probably unsuccessful.

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ARTICLE II.

ON AFFECTIONS OF THE EYE-MUSCLES IN DISEASES OF THE BRAIN AND SPINAL CORD. By HENRY G. CORNWELL, M.D., of Los Angeles, California; Late Prof. of Diseases of the Eye and Ear, Starling Medical College, Columbus, Ohio; Ophthalmic Surgeon to St. Francis Hospital, etc.

DISTURBANCE in the function of the eye-muscles is observed in many forms of brain disease. This condition is brought about by intra-cranial diseases, which affect the innervation of one or all of the three motor nerves distributed to the eye, viz., the third, or *motor oculi*, which supplies the levator palpebrarum and all the muscles of the globe of the eye except the superior oblique and the external rectus; the fourth, or *patheticus*, which supplies the superior oblique; and the sixth, or *abducens*, which supplies the external rectus. The *facialis* is also to be included in the group of motor eye-nerves, as some of its filaments are distributed to the orbicularis palpebrarum.

Tonic spasm may affect the eye-muscles in some intra-cranial conditions, giving rise to strabismus. This is occasionally observed in the first or irritative stage of acute inflammatory affections of the brain, as, for example, in basilar meningitis. It may also be seen in epilepsy, at times in hysterical convulsions, and also in the convulsions of infancy due to teething, worms, etc. This form of spasm, in the greater number of instances, affects the internal rectus, the irritation giving rise to it being doubtless at the root of the third nerve in the floor of the fourth ventricle. The pupils are in most instances contracted, proving that the squint is the result of nerve irritation.

Clonic spasm of the eye-muscles is a rare condition, which is seen in some cases of brain tumours, cerebral sclerosis, and tubercular meningitis.

Strabismus, on the other hand, may be the result of paralysis of one of the recti muscles due to a disturbance in the innervation of the nerves supplying them. This may be the result of (1) pressure *directly* applied to the nerves, as may be seen in the case of tumours, such as aneurisms, gummata, or exostoses, at the base of the brain. This form of pressure may also be brought about by the products of some inflammatory condition, originating at the base of the brain, as in the case of chronic basilar or basilar tubercular meningitis, or some other form of inflammation originating elsewhere within the cranium, and extending to the base of the brain. Meningitis limited to the convexity rarely gives rise to such eye symptoms, for anatomical reasons.

Strabismus may be due to (2) pressure *indirectly* applied, as in the case of glioma, fibro-sarcoma, tubercular formations, etc., situated in the substance of the brain, at a point some distance from the affected nerves.

Instead of a complete paralysis of an eye-muscle due to intra-cranial

disease, there may be only a paresis of the muscle, no deviation in its relation with its fellow being noticeable to an observer, further than, in marked cases, a halting or jerking in the movements of the eye toward the affected side. The subjective symptom of this condition is diplopia, or double vision, the distances of the images from each other being dependent upon the extent to which the affected muscle is enfeebled, and also upon the direction in which the eyes are turned. In some cases it is very slight. Krishaber says that double vision occasionally exists in congestion of the brain, but only when the subject directs his eyes to very bright objects. Only one of the recti muscles supplied by the third nerve may be affected, or perhaps the levator palpebrarum, giving rise to partial or complete ptosis. Paralysis of a single eye-nerve is rare in brain disease, for anatomical reasons. The nerves lie close to each other after they emerge from the brain, and more especially as they approach the sphenoidal fissure. Where one nerve only is affected, in adults with no brain symptoms, the condition giving rise to it is in most instances to be found in the orbit, perhaps due to a small tumour, or to an inflammation of the sheath of the nerve, the result of rheumatism or syphilis. It is possible for a periostitis at the sphenoidal fissure to affect but one of the eye-nerves, but no inflammation of very marked character can take place at this point without involving the others more or less completely. Hulke found, in 127 cases of paralysis of the eye-muscles, the external ones affected in 84 cases, the internal ones (iris and ciliary muscle) in 19 cases, both together in 24 cases.

Paralysis or paresis of the eye-muscles may be periodical in character, as is observed in some cases of basilar tubercular meningitis, cerebral syphilis, tumours, abscesses of the brain, and in the early stages of *tabes dorsalis*.

Hasner reports an interesting case¹ of periodical paralysis of the third nerve.

CASE I.—A girl aged 17, with each menstrual period had complete paralysis of the third nerve on the left side. The condition appeared regularly during the preceding four years, and lasted three days. It was ascribed to a periodical hyperæmia, causing pressure at the nucleus of origin of the affected nerve.

By far the greater number of the cases of paralytic squint is due to syphilis. It is the most frequent, and often the first symptom of cerebral syphilis. As this condition manifests itself oftentimes many years after the time of inoculation, the cause of the paralysis may be easily overlooked. As stated in a preceding paragraph, although the cause of the paralysis may be syphilis, its seat is not always intra-cranial, but, at times, in the orbit. In the order of their frequency, the third nerve is oftenest affected, then the optic, facial, sixth, and fourth. Schubert found in 20,000 cases of eye disease in the clinic of Prof. Cohn, 17.4 per cent. of paralytic affec-

¹ Wiener med. Wochenschr., No. 12, 1883.

tions of the muscles of the eye due to syphilis, of which 27 were cases of paralysis of the third, 13 of the sixth, and 1 of the fourth.

In very rare instances, the pupil is observed to be dilated in cases of paralysis of the sixth nerve. In this connection, A. Gräfe says :¹ "Where mydriasis paralytica occurs conjointly with paralysis of the abducens, it is *not at all* requisite to refer the present cause of the paralysis to two different nervous tracks, for Adamück, in three cases among forty-two (in experimenting on animals), found the pupil-contracting fibre ramifying not in the trunk of the oculo-motorius, but in that of the abducens." Hirschberg reports the following case :—²

CASE II.—A man aged 50 presented himself with paralysis of the right abducens, mydriasis and paresis of the muscle of accommodation. The condition remained unchanged for some weeks. He then disappeared for four months, and returned with paralysis of all the muscles of the right eyeball together with ptosis, mydriasis, paralysis of the muscles of accommodation, and insensibility of the cornea on the same side. Cause of the condition and further history of the case not given.

The author regards this case as one in illustration against the view of Adamück, and speaks of a second case of paralysis of the sixth, and also mydriasis of the same eye, which remained after the paralysis of the sixth disappeared.

Paralysis of a single eye-nerve in previously healthy children is a condition of much significance, as it often precedes tubercular meningitis. In adults, when two or more nerves are affected, it indicates brain disease, although not always, for the orbit may be the seat of the disease. If one of the eye-nerves and one of the other cranial nerves be paralyzed, the cause is intra-cranial ; for example, if the third and the facial are affected, the seat of the disease is central, because the places of exit of these nerves from the cranium are remote from each other. Sturge has reported two cases³ of simultaneous paralysis of both third nerves.

CASE III.—A man aged 72, after an apoplectic attack, had paralysis of all the muscles supplied by the third nerve on the right side, and all the muscles of the left side except the levator. The condition remained permanently. The author believed there was probably a small hemorrhage into the pons.

CASE IV.—A boy, aged 16, subject to headache, dizziness, and vomiting had an apoplectic attack, and recovered with complete paralysis of all the third nerve muscles of each eye. Recovery took place after seven weeks. In this case the author believes there was a small hemorrhage at the nuclei of origin of the third nerves.

Hulke reports the two following cases :—⁴

CASES V. and VI.—Each of the cases had paralysis of all the muscles supplied by the third pair, together with mydriasis and impairment of cutaneous sensibility on both sides of the face. The condition was, in one case, due to syphilis, and in the other to an injury.

¹ Gräfe-Sämisch, Bd. vi. p. 56, note.

² Arch. of Ophth., viii. 8, p. 356.

³ Trans. Ophth. Soc., vol. i. 1881, p. 165.

⁴ An. d'Oculistique, Juil.-Août, 1882.

He also reports the following case :—¹

CASE VII.—A sailor, aged 31, had paralysis of all the extra-ocular muscles on each side, supplied by the third nerve, except the levator palpebrarum. The irides and ciliary muscles were unaffected.

The following cases are on record, in which a number of the cranial nerves have been paralyzed, including the motor nerves of both eyes :—

CASE VIII.—Power has recorded the history of a case (the original report of which I have been unable to obtain) in which a tumour in one of the cerebral hemispheres caused the paralysis of ten of the twelve cranial nerves, including all of the eye-nerves.

At the last meeting of the American Medical Association held in Cleveland, O., in a paper² read before the Section of Ophthalmology and Otology, I reported the following case of paralysis of six pairs of cranial nerves, the result of chronic basilar meningitis :—

CASE IX.—“J. D., æt. 37, a dentist of Columbus, visited me May 18, 1883. During the war, he received a flesh wound in the right forearm, and was left uncared for in a vacant house for 48 hours; the nights were very cold. Following this he had swamp-fever and subsequently became seriously ill with some form of brain disease. His recovery was complete except so far as his eyes were concerned, they having remained unchanged since his convalescence, except that his visual power is monthly decreasing.”

“*Status præsens* :—Patient in an advanced stage of pulmonary consumption; no history of syphilis. Absolute immobility of both eyeballs, together with double ptosis, from paralysis of the third, fourth, and sixth pairs of cranial nerves. Paralysis of the facial on both sides; some impairment of cutaneous sensibility over the face. Vision, ability to count fingers at five feet. The optic nerves in an advanced stage of secondary atrophy; the irides and ciliary muscles not paralyzed. He has never had any form of general paralysis, and his intelligence has not been impaired since his illness.”

CASE X.—Königsten has reported a case³ of paralysis of all the motor nerves together with atrophy of the optic nerves, anæsthesia of the fifth pair, and neuro-paralytic keratitis on one side.

CASE XI.—Anderson has reported the case⁴ of a man aged 34, who had at first paralysis of the left externus with drowsiness and stupor, then vertigo, headache, hiccough, and profuse viscid salivation lasting many hours, together with difficulty in swallowing, and paresis of one facial nerve. The paralysis later involved all the other external muscles of each eye. A glioma of the medulla oblongata projecting into the fourth ventricle, and larger on the right side was discovered at the autopsy.

In some cases all the muscles of the globe are affected, but the functions of the iris and ciliary muscle remain undisturbed. Indeed, judging from my own observations and from the literature of the cases reported, this is the rule rather than the exception. The only explanation for this fact is that the separate nuclei of origin of the branches of the third distributed to the iris and ciliary muscle are not affected. Why the pupil should not be affected in a case of paralysis of all the muscles of the eye from basilar meningitis (see Case IX.), I cannot explain. In some cases, the condition of the pupil is not noted. In such cases, it can fairly be presumed that

¹ Ibid.

² Journ. Am. Med. Ass'n, Sept. 8, 1883.

³ Wien. med.-chir. Rundschau, April 12, 1878.

⁴ Edinburgh Med. Journ., 1881, Sept., p. 209.

the functions of the iris and muscle of accommodation are normal (see Case XI.). I have observed the following case :—

CASE XII.—In May, 1882, a seaman, aged 53, came to my clinic at Starling Medical College, with paralysis of all the recti muscles and the levator of the left side, together with paralysis of the external rectus of the other eye. The functions of the iris and ciliary muscle of each eye were normal. He gave a syphilitic history. He was seen but two or three times, during which time no improvement was noticeable.

Ravà reports a similar case :—¹

CASE XIII.—A young man, aged twenty, had complete paralysis of the six recti muscles and the levator of one eye, the sphincter iridis alone being unaffected. The accommodation could not be tested. The eye was turned downwards and inwards. The cause was regarded as rheumatic. The patient recovered after six weeks' electric treatment.

Lichtheim has reported the following case :—²

CASE XIV.—A formerly healthy girl, 21 years old, came under observation with paralytic ptosis and exophthalmus in both eyes, but more marked in the left eye. All of the muscles of the right eye were affected except the superior oblique and external rectus. All the muscles of the left eye were affected. Pupils and accommodation normal. The affection was ascribed to a lesion of both nuclei of the oculo-motor and of the left trochlearis and abducens.

CASES XV., XVI., XVII.—Förster of Breslau has reported three cases.³ The eyeball and lids were immovable. The pupils responded to light. The paralysis was believed to be due to a lesion at the floor of the aquæductus Sylvii and the fourth ventricle.

See also Cases VII. and IX.

The following case of Flemming, published in the *British Medical Journal*, in 1868, and quoted by Eulenburg in his *Lehrbuch der Nervenkrankheiten*, 1871, is interesting in this connection.

CASE XVIII.—The patient had paralysis of all the muscles of the eye supplied by the third, fourth, and sixth nerves, together with the iris and ciliary muscles on the right side. After a course of treatment which included the administration of iodide of potassium, quinine, and iron, the functions of the extra-ocular muscles were restored, the mydriasis and paralysis remaining permanently.

In a case of progressive ophthalmoplegia, Gowers found at the autopsy,⁴ the third, fourth, and sixth pairs atrophied and the nuclei of origin degenerated. The sensory part of the fifth pair was also similarly affected. Small patches of degeneration were also found in the pons and medulla oblongata corresponding to the changes observed in the anterior horns and spinal nerves in progressive muscular atrophy.

A very rare condition is the absence of motor innervation affecting the muscles of the eyeball, due, doubtless, to a lesion at the centre of innervation in the brain, which brings about the movements of the eyeballs. Adamück thinks this centre is somewhere in the anterior tubercle of the corpora quadrigemina. He reports the following case :—⁵

¹ Arch. of Ophth., xii. 1, p. 115.

² Corrb. f. Schweizer Aertze, 1882, Nos. 1 and 2.

³ Centralbl. f. Augenheilk. 1878, p. 221.

⁴ Lancet, vii. 1879.

⁵ C. f. A. 1879, p. 74.

CASE XIX.—The patient, a man aged 40, always held the eyes looking straight forward, being unable to turn them in any direction voluntarily. If his attention was called to any object, or if his head was turned by some other person, the eyes would remain for a few seconds in their former position, and then were again directed straight forward.

If two or more of the motor nerves of the eye are affected, or one and the facial, the disease is apt to be in the neighbourhood of the fourth ventricle. The eye-nerves rise from the vicinity of this ventricle and the aqueduct of Sylvius. The nucleus of the third nerve is most anterior. Immediately back of this lies the fourth, and near the posterior third of the pons is the nucleus of the sixth. There is a complete decussation of the fibres of the fourth and probably also of the fibres of the third. The fibres of the sixth are not crossed. The paralysis of the fourth nerve (and probably also the third) is crossed, while in the case of the sixth, the central disease is on the same side. According to Hammond the occurrence of strabismus lessens the hope of a favourable termination in meningitis. According to Nothnagle, it is a precursor of death in tetanus.

Lagophthalmus or paralysis of the orbicularis palpebrarum, due to an affection of the facial nerve, is but rarely observed. It may be associated with an affection of the other muscles of the face supplied by this nerve, or the fibres distributed to the eye-muscle may alone be affected. According to most authorities, it is rare in hemiplegia. Berger has however found that, in 32 cases of ordinary hemiplegia, the orbicularis was affected to a distinct but not marked degree. He thinks, therefore, that the facial nerve must have a cortico-bulbar bundle of fibres, which comes from the cortex cerebri, and passes downwards through the basal ganglia or inner capsule.¹

Strabismus is occasionally observed to be the result of hysteria. As a rule, it is of short duration, and appears to be after the paralytic form. Manz relates the following case :—²

CASE XX.—“A nervous young lady, of weak constitution, was suddenly attacked, while the subject of headache, with convergent strabismus, especially of the right eye. At the same time, a high degree of amblyopia set in along with concentric narrowing of the field of vision, and spasm of accommodation. Ophthalmoscopic examination revealed nothing except a doubtful anomaly of formation, probably due to nerve-fibres with a double contour. The patient had almost recovered from the condition above described at the end of eight weeks ; while it lasted, clonic convulsions occurred several times. A short time after the patient had been dismissed, a relapse occurred in which, in addition to the previous symptoms, there was transient anæsthesia of the first and second divisions of the fifth nerve. The relapse disappeared at the end of three weeks, and was, after a few days, succeeded by a third, which lasted four weeks, and left slight impairment of visual acuity with asthenopic troubles.”

CASE XXI.—Snell observed a case³ of hysterical ptosis in a girl twelve years old, who had been menstruating during the previous six months. She recovered after treatment.

¹ Arch. of Ophth., ix. 4, p. 511.

² Brit. Med. Journ., Oct. 30, 1880.

³ Ophth. Rev., Dec. 1882.

See also case XXXVI.

The muscular disturbances in *tabes dorsalis* require separate consideration. In this condition, the paralysis often precedes the other symptoms some months, and, at times, many years. Hughlings-Jackson found in 6 out of 19 cases diplopia to be the first symptom. The paralysis or paresis more frequently develops gradually, there being at first only a slight transitory diplopia. After it has fully developed and remained stationary for a time, it is apt to disappear. It very seldom lasts through life, and is never met with, according to Smeichler,¹ in other cord diseases. Erb found paralysis of the eye-muscles in 17 of 56 cases. Boles found it in 4 of 12 cases. Wilbrand in 6 of 13 cases, in two of which it was permanent. Moli found it in 39.6 per cent. of his cases. Stewart in 70 cases found 20 cases of squint, 3 cases of ptosis, and 4 cases of diplopia. Hutchinson says that transient ptosis is so common in *tabes*, that in a case of spontaneous recovery *tabes* may be diagnosed. Westphal says that in incipient atrophy of the optic nerve, or paralysis of the eye-muscles, the absence of the knee-phenomenon indicates beginning *tabes*. Charcot says the order of frequency of its development is first the third, then the sixth, and very rarely the fourth. The relative frequency of affections of the eye-muscles compared with pupillary changes and disease of the optic nerves in *tabes* may be seen from the following table by Cyon.²

In 203 cases of *tabes*, he found 106 cases of eye disease as follows :—

Amblyopia	33
Paralysis of eye muscles	30
Mydriasis	3
Myosis	9
	<hr/>
	75
 Amaurosis with affection of eye muscles	 16
Amaurosis with mydriasis	8
Amaurosis with myosis	1
Affection of eye muscles with mydriasis	4
	<hr/>
	29
Amaurosis with mydriasis and affection of eye-muscles	2

The seat of the lesion in paralysis of the eye-muscles, dependent upon ataxia is doubtful. Förster thinks it is in the floor of the fourth ventricle, but Kahler³ found no trace of disease at the nucleus of the third nerve in a case where there had been paresis of some of the muscles supplied by this nerve. Buzzard reports two cases⁴ of paralysis of all the external ocular muscles in patients having ataxia. In the second, at the autopsy, neither of the sixth nerves nor the third of the left side could be discovered. The other cranial nerves were healthy. There was also atrophy of the nerve

¹ Arch. f. Augenhellk., xii. 4.

² Die Lehre von der *Tabes dorsalis*, Berlin, 1867.

³ Arch. of Ophth., xii. 3-4, p. 360.

⁴ Brain, April, 1882.

elements with dilatation, plugging, and rupture of the minute vessels at the nucleus of the sixth. The nuclei of the other eye-nerves were unaffected. Marked changes were found in the cord. Smeichler¹ thinks that since the course of the sclerotic process follows that of the arteries, as has been shown by Adamkiewicz, the same sclerotic process should follow the superior and inferior cerebral arteries, which supply the basal ganglia of the eye-muscles with blood, as well as the vertebral artery which supplies the posterior column of the cord, the cerebral arteries being the ascending branches of the vertebral. He says it is only through such a process that the disturbances peculiar to tabes in the ocular muscles can be brought about.

Disease of the cervical division of the sympathetic gives rise to certain eye-affections which may readily be taken as symptoms of brain disease. Wagner and Müller, by experiments on decapitated criminals, proved the existence of smooth-muscular fibres which extend backward into the orbit from the posterior edge of the tarsal cartilages. Horner, in a paper² published in 1869, called attention to a form of ptosis, the result of an affection of these muscular fibres, the upper lid hanging down to a slight degree over the cornea, together with an elevation of the ciliary border of the lower lid. The lid affection was accompanied by contraction of the pupil, both conditions being due to paralysis of the cervical sympathetic. The fact that there is myosis together with the lid affection should lead us to look to the sympathetic rather than the third nerve for an explanation of the condition. Brunner has observed the following case illustrative of the effects of irritation of the cervical sympathetic on the eye.³

CASE XXII.—An epileptic woman, aged 27, came under observation with marked atrophy of the left side of the face, the skin of which was wrinkled, blistered, and dry, there being not the slightest perspiration on its surface. The eyelids of the left side were widely separated, and the pupil of the same side markedly dilated, the reaction to light being at the same time very sluggish.

If disease be located in the cerebellum, paralysis of the eye-muscles can only occur through its transmission to the base of the cerebrum. Nystagmus is a condition, which according to Nothnagle, frequently attends disease of the cerebellum. This is a peculiar restlessness or oscillation of the eyeballs, which is commonly horizontal, at times rotatory, and in rare instances vertical. According to Hammond, it is rarely absent in disease of this part of the brain. It is also, according to Prévost, observed associated with conjugate deviation of the eyes after apoplexy. According to Charcot, it is observed in one-half of the number of cases of disseminated sclerosis of the brain. Förster says⁴ that, in partial cerebral sclérosis, the eyes are almost the only organs of the higher sensory class

¹ Arch. of Ophth., xii. 3-4, p. 361.

² Ueber eine Form von Ptosis. Klin. M. f. Augenheilk. 1869.

³ Förster, Allgemein-Leiden und Veränderungen des Sehorgans, 1877.

⁴ Allgemeinleiden und Veränderungen des Sehorgans, 1877.

that become affected. The optic nerves are sometimes affected, but for a diagnosis of cerebral affections, the condition of the eye-muscles which exhibit tremor is much more important, and that it is a symptom which rarely occurs in other cerebral affections following a chronic course. The nystagmus he regards as a symptom corresponding to the tremor of the extremities, which takes place when they are moved, and not when they are in repose. This affection of the eye-muscles must be, he thinks, after the paretic form. Nystagmus is also observed in tabes when objects are looked at closely. It is also observed after certain injuries, which produce, doubtless, a molecular disturbance in the brain, after cerebellar hemorrhage, thrombosis of the venous sinuses, some forms of insanity, and malformations of the skull with or without idiocy. Shaking of the head and spasm of the orbicularis palpebrarum is frequently associated with it. Pierd'houy found among 900 insane, nystagmus in 0.5 per cent.; among 46 cretins, nystagmus in 4 cases, and convergent strabismus in 2 cases. Among 30 idiots was found nystagmus in 3 cases, convergent strabismus in 1 case, and divergent strabismus in 1 case. Rahlman observed among 800 insane, 5 cases of nystagmus, 3 being idiots. Pflüger has called attention to the fact¹ that nystagmus is to be seen at times in connection with ear disease. This is not improbable, considering the marked disturbance in the functions of the nervous system which chronic catarrhal and acute or chronic suppurative diseases of the middle ear are capable of bringing about.

Bechtereff² found that severe mechanical irritation of one of the olives in the medulla oblongata of dogs caused nystagmus of both eyes, which remained permanently. The eye on the affected side turned downwards, and outwards, and the other upwards and inwards. Bouchaud³ made an autopsy in a case of horizontal unilateral nystagmus and found atrophy of the third and sixth nerves of the affected side.

Associated paralysis of the eye-muscles is sometimes observed in brain disease. The two eyes are affected, and the patient is unable to turn them in a certain direction; *e. g.*, both superior recti may be affected and the patient may be unable to look upwards, or the internal rectus of the right eye, and the external rectus of the left eye may be paralyzed, and the patient thereby unable to turn the eyes toward the left side. Where the movements of the eyes to the right or to the left are affected, there is also apt to be some impairment in the movements either upwards or downwards. Adamück, by experimenting on animals in the physiological laboratory at Utrecht, in 1869, discovered that the anterior pair of the tubercula quadrigemina are the centres for the associated movements of the eyes and that the action was crossed; that irritation of the

¹ Deutsche Zeitschr. f. prakt. Med., 1878, No. 35.

² Arch. of Ophth., xii. 2, p. 257.

³ Arch of Ophth., xii. 2, p. 263.

right tuberculum produced rotation of the eyes to the left side, and *vice versa*, and also that severe irritation caused the head to turn in the same direction as the eyes. He further discovered that irritation at a point between the tubercles caused the eyes to turn upwards with simultaneous dilatation of the pupils. On irritating the posterior part of either anterior pair of tubercles, the eyes became strongly converged and directed downwards. The pupils became also contracted. On irritating the floor of the aqueduct of Sylvius, the eyes were turned strongly inwards. Duval, in 1880, demonstrated the fact that from the nucleus of the sixth nerve, which supplies the external rectus in the floor of the fourth ventricle, a branch is given off to the third nerve of the opposite side. A lesion at the nucleus of the sixth therefore would give rise to paralysis of the external rectus of one eye, and of the internal rectus of the other eye, and motion would be in the direction of the sound side. Féréol observed such a case in a patient having tuberculosis. A tubercular tumour in the neighbourhood of the nucleus of the sixth nerve was diagnosed. On post-mortem examination, the diagnosis was verified. A. Gräfe and Nieden, who have each observed cases of paralysis of both superior recti, diagnosed a lesion in the median line between the corpora quadrigemini. If the observations of Adamüick and Duval are correct, and those of the former apply to man as well as to animals, it would appear that a lesion in either of the anterior tubercles, or at the nucleus of the sixth nerve, would produce associated paralysis of the eye-muscles. This condition occurs in connection with chronic forms of brain disease, such as tumours, tubercular deposits, or syphilis. I have collected the following cases:—

CASE XXIII.—Gowers has reported the case¹ of a patient, who, when first seen, had optic neuritis and paralysis of the superior recti of both eyes. The condition subsequently improved, the upward movements of the eyes being increased. The optic disks had undergone partial secondary atrophy. The intracranial disease was regarded as a tumour.

CASE XXIV.—Kubli has published² the history of a case of associated paralysis of the left externus and right internus in a syphilitic subject. Cure followed treatment.

CASE XXV.—Nieden has published a report of a case³ of paresis of the superior rectus and inferior oblique muscles of each eye, together with clonic spasms of the other eye-muscles. The patient was unable to raise the eyes above the horizontal position, or to either side. An attempt to do so with the head fixed caused spasm of the lateral muscles, giving rise to rapid movements. Vision was also affected. The patient recovered.

CASE XXVI.—Nieden has also narrated the history of a case⁴ of associated paralysis of the externus of one side and the internus of the other, together with double optic neuritis, paralysis of the right facial, and left-sided hemiplegia. The autopsy showed a glio-sarcoma of the right side of the pons and medulla oblongata.

CASE XXVII.—Gajewicz has narrated the history of a case⁵ of associated paralysis of two of the lateral muscles of the eye dependent upon tubercular tumours in the pons.

¹ Trans. Ophth. Soc., vol. ii. p. 84, 1882.

² Zehender's Monatsbl., xviii. p. 426.

³ C. f. A., iv. p. 269.

⁴ Arch. f. Augenheilk., 1882.

⁵ C. f. A., vi. 1, 18.

CASE XXVIII.—Graux has reported a case¹ of associated paralysis of two lateral muscles in a patient having bulbar paralysis.

CASE XXIX.—Wernicke has reported the case² of a patient having paresis of association of two lateral muscles which was cured by iodide of potassium. Diagnosis, tumour of pons.

CASE XXX.—Falkson has published the history of a case³ of paresis of both superior recti muscles, and the internus of one eye, due to cystochondroma in the third ventricle.

CASE XXXI.—Bernhardt has reported the following case.⁴ A boy four years old had paresis of the right facial together with paralysis of the sixth on the same side. Five months later, he had paresis of the left internal rectus. At the post-mortem examination, a tumour was found in the right half of the pons, affecting also the nuclei of the facial and the sixth nerves.

CASE XXXII.—De Vincentiis observed a case⁵ of lateral associated paralysis in a tuberculous girl, aged thirteen. The autopsy revealed the presence of a tubercular tumour the size of a pea on the floor of the fourth ventricle in the corpus candicans. No lesion was noticed in the aqueduct of Sylvius.

CASE XXXIII.—Lang and Fitzgerald have reported a case⁶ of homonymous hemianopsia together with associated paralysis of the eye-muscles so that the eyes could not be directed upward or downward. The patient rapidly recovered with homonymous insular scotomata as sequelæ.

Langer has reported two cases.⁷

CASE XXXIV.—A woman, aged 26, had paresis of the sixth nerve on the left side, and of the facial on the same side. Later also of the internal rectus of the right side, together with choked disk, mydriasis, and psychical disturbances. A tumour of the pons was discovered at the autopsy.

CASE XXXV.—A man, aged 41, had paralysis of the right internal rectus and the left external rectus, together with headache, anæsthesia of the right side of the body, mydriasis, and impairment of the sense of taste on the same side. A tubercular formation the size of a hazel-nut was found in the right side of the pons.

Disturbance in the motor innervation stimulating the associated movements of the two eyes may be dependent upon hysteria. The following is a case:—

CASE XXXVI.—In June, 1883, I was asked to see Mrs. J., aged 43, a married lady who had never borne children. Menstruation irregular. For the last two years she could not hold her eyes in a position above the horizon more than two or three seconds at a time, the movements on the part of the eyes requiring the greatest effort. She never had headache, and her intelligence was unimpaired. She gave a strong hysterical history. Treatment by means of tonics and anti-spasmodics produced a cure after a few weeks.

Conjugate deviation of the eyes is a condition which is liable to be mistaken for associated paralysis of the ocular muscles. This includes a deviation of the two eyes in the same direction, the deviation being due to spasm, and not paralysis of the muscles. At times the head is turned in the same direction as the eyes. The eye-deviation is in the direction of the sound side of the head, and is said by Hammond to be seen in one-

¹ Gaz. Med., 1878, No. 50.

² Berlin klin. Wochenschr., 1881, 27 and 28.

³ Virchow's Arch., vol. 75.

⁴ Berl. Ges. f. Psych., 12-7, 1880.

⁵ Arch. of Ophth., xii. 3 and 4, p. 513.

⁶ Arch. of Ophth., xii. 1, p. 146.

⁷ Wiener med. Press., Nos. 4 and 6.

third of the cases of apoplexy. It is observed as the result of lesions in different parts of the cerebrum, often in the vicinity of the corpus striatum, peduncles, and tubercula quadrigemini. The muscular spasm is evidently due to an intracranial irritation of the motor eye-nerves. Hunnius and Leichtenstern are of the opinion that, if in unilateral convulsions, the eyes and head deviate toward the other side, the lesion is in the pons, in which they think there is undoubtedly a common centre for the sixth and third nerves, probably near the nucleus of the sixth. Beeror calls attention¹ to the frequent association of conjugate lateral deviation of the eyes with epilepsy. He observed it in 11 out of 13 cases.

The following exceedingly interesting case² has been reported by Bechterew.

CASE XXXVII.—A patient, aged 36 years, had hemiplegia of the right side together with progressive paralysis involving other muscles. The head and eyes were also rotated at first toward the right side, the eye-muscles being affected with clonic contractions. As death approached, the head and eyes were turned toward the left side. The autopsy revealed internal hydrocephalus, atrophy of the frontal, and anterior central convolutions and sclerosis of the right lateral column.

A very rare condition is what A. Gräfe calls disjunction of the coördinative movements of the eyeballs. In this condition the visual axes of the two eyes may strongly converge, or one eye may turn outwards to the right, and the other to the left, or one may be directed upwards and the other downwards, or one inwards, and the other upwards. Gräfe observed such a case in a boy with brain disease. At one time one eye would turn slowly outwards and the other upwards, and, in a few seconds, they would assume other peculiar positions.

ARTICLE III.

A CASE OF ERYSIPELAS COMPLICATING PREGNANCY. By WILLIAM L. WARDWELL, M.D., Late House Surgeon Bellevue Hospital, New York; Assistant Surgeon N. Y. Polyclinic; Attending Surgeon, University College Dispensary.

K. H., aged 26 years, of Irish parentage; a small, slightly-built woman, was admitted to the female erysipelas pavilion of Bellevue Hospital, November 28, 1882, suffering from a cutaneous erysipelas of the right side of the face. The initial chill with some gastric disturbance had occurred on the morning of the 27th. The blush first appeared on the morning of the day she entered the hospital. Questioning subsequently elicited the facts that she had borne no children; had miscarried two years previously;

¹ Brit. Med. Journ., Jan. 21, 1882.

² St. Petersburg. med. Wochenschr., 1881, Nos. 11-13.

and had never before been attacked by erysipelas. She volunteered the information that she was then three months advanced in pregnancy.

Her temperature taken at this time was $103\frac{1}{2}^{\circ}$ Fahr. On the morning of November 29 she experienced labour-pains, which increased in severity until six o'clock in the evening, when she aborted. An intrauterine douche of carbolic acid (1—60) was given, and ordered to be repeated every four hours, in addition to tinc. ferri chlorid. $\text{m} \times$, every two hours. Quin. sulph. gr. v, t. i. d., and local applications of lead and opium wash to the inflamed integument, which had been prescribed the day before. During that night the patient rested well, her temperature sank to $98\frac{1}{2}^{\circ}$ during the early morning hours, and she complained of no pain in abdomen or parturient canal. 30th, 7.30 A. M. had a slight chill and her temperature, which before the chill was normal, immediately began to rise, and at 10 A. M. was $103\frac{3}{8}^{\circ}$. The administration of an intrauterine douche which was due at that time reduced the temperature to $102\frac{1}{2}^{\circ}$, but it rose again rapidly, and at 4 P. M. was again $103\frac{3}{8}^{\circ}$. About this time she began to complain of pain in the abdomen. The belly was slightly tense, and complaint was elicited when pressure was made over the uterus; the douche washings were slightly stained with blood, but the discharge was not offensive. The erysipelas still persisted, but had not progressed beyond its original limits. Knowing that many cases of puerperal fever had been traced to poisoning by erysipelas, great anxiety was aroused as to the ultimate result of the case, especially as the appearance of uterine symptoms and the continuous high temperature led me to fear a similar complication.

At nine o'clock in the evening my colleague, Dr. Fruitnight, kindly made, at my request, an examination of the vagina and uterus. The os was found to be dilated, and the uterine cavity filled with a soft body, which was removed with placental forceps, and was found to consist of blood clots and a few shreds of membrane. Her temperature sank during the night, and at 4 A. M. of December 1st was $101\frac{1}{4}^{\circ}$, but at 10 A. M. had risen to $102\frac{3}{4}^{\circ}$. It was remarked at this time that the blush had spread to the other side of the face. This was sufficient to explain the chill and high temperature of the previous day. The abdominal symptoms had much improved. The douches were only slightly stained, and were not offensive. At 2 P. M. the temperature was $104\frac{1}{2}^{\circ}$; this was the highest point that it reached during the day. During the night it again fell, and at 4 A. M. of December 2d was only 99° . On this morning a further progression of the erysipelatous blush was observed, it having invaded one side of the neck. At 10.40 A. M. experienced a very severe chill, her temperature rose rapidly, and at 12 M. was $103\frac{1}{4}^{\circ}$. During the afternoon she again complained of pelvic pains; a uterine examination revealed nothing. 3d, 8 A. M. Temperature normal; a number of clots were present in the douche water. The erysipelas during the night had spread over the upper portion of the left side of the chest. During the afternoon her temperature rose to $103\frac{1}{2}^{\circ}$, but during the night fell again, and at 4 A. M. of December 4 was $98\frac{1}{2}^{\circ}$.

The remainder of the history is quickly related. After the passage of the clots on November 3d, the uterine symptoms completely subsided. Intrauterine douches were kept up for two days, but at the end of that time, as they were not even streaked with blood, they were discontinued, and in their stead was substituted a vaginal douche, morning and evening. During the further course of the disease the febrile movement was as follows:—

- Dec. 4. 8 A. M., $98\frac{1}{2}^{\circ}$; chill, 12.45 P. M.; 1 P. M., $99\frac{1}{2}^{\circ}$; 5 P. M., 101° .
 5th. 8 A. M., 99° ; chill slight, 10 A. M.; 1 P. M., $103\frac{1}{2}^{\circ}$; 5 P. M., $102\frac{3}{4}^{\circ}$.
 6th. 8 A. M., $98\frac{1}{2}^{\circ}$; chill none, 10 A. M.; 1 P. M., $98\frac{1}{2}^{\circ}$; 5 P. M., $98\frac{1}{2}^{\circ}$.
 7th. 8 A. M., $98\frac{1}{2}^{\circ}$; chill, 10.40 A. M.; 1 P. M., 103° ; 5 P. M., 104° .
 8th. 8 A. M., $98\frac{1}{2}^{\circ}$; chill none; 1 P. M., $98\frac{1}{2}^{\circ}$; 5 P. M., $100\frac{1}{2}^{\circ}$.
 9th. 8 A. M., 104° ; chill, 4 A. M.; 1 P. M., 104° ; 5 P. M., 100° .
 19th. 8 A. M., $98\frac{1}{2}^{\circ}$; chill none; 1 P. M., $98\frac{1}{2}^{\circ}$; 5 P. M., $98\frac{1}{2}^{\circ}$.

During these six days the progress of the erysipelas was continuous, the blush wandered over both sides of the chest and down the back to the lower borders of the scapulæ, and back again over both sides of the face. No further uterine disturbance was experienced.

In summarizing this case it can be said that it was a case of erysipelas lasting twelve days, marked by an almost daily chill and febrile rise, with a distinct *remission*, oftentimes *intermission*, of the fever in the morning. Each one of these febrile disturbances was followed by a distinct progression of the erysipelatous blush, and was seemingly a proclamation of a new invasion of tissue by the disease. Upon the second day of the disease the patient aborted, and for four days thereafter experienced abdominal pains, which, taken in connection with the chills and high temperature, aroused suspicions of uterine inflammation as the result of absorption of erysipelas poison by that organ.

All of these symptoms left her on the sixth day of the disease, and she quitted the hospital several weeks later completely cured. During the course of the disease every opportunity for absorption of poison by the uterus was present. Isolation of the patient was impossible. The other beds in the pavilion, eleven in number, were filled with cases of erysipelas, both cutaneous and cellular, one being a particularly severe case of phlegmonous erysipelas of the leg and thigh. The nurse and physician were the only skilled attendants upon the patient, and while the former confined her attentions as far as possible to this one patient, she could not avoid contact at times with the others. She was instructed in intrauterine douching, which she performed thoroughly, and always preceded by thorough disinfection of her hands and of the douche bag. These douches were given with a view to prophylaxis, following the treatment then in high repute upon the fourth medical division of Bellevue Hospital, of often-repeated uterine douches in puerperal fever.

The question of the relationship between erysipelas and puerperal fever has always been an interesting one—one over which discussion has been frequent and opinions varying. Many are the instances of epidemics of puerperal fever in which the apparent exciting cause has been a case of erysipelas, and where the puerperal fever patients have in turn caused erysipelas in their attendants. Simpson considers the two synonymous; but while this view of the matter is not accepted at the present day, the tendency among the profession is to regard the connection between these diseases as a close one, and to hold the practitioner who attends cases of

erysipelas and of labour at the same time guilty of gross carelessness, if not even of malpractice.

It is not the object of this paper to discuss this question in all of its bearings, but to restrict it to those cases in which the physician is *forced* to treat both conditions—in those cases in which erysipelas complicates pregnancy and produces premature labour. When a pregnant woman is attacked by erysipelas, in what proportion of cases does abortion occur? At what period of the disease does abortion occur? What influence have the situation and variety of the disease upon the prognosis? What is the mortality from such a coincidence? These were questions that I asked myself during the progress of my case—questions that no one seemed able to answer, and upon which the text-books were silent. For the purpose of answering these questions, if possible, I have looked up the literature of the subject; the results of this search are comprised in the accompanying table.

These cases, twenty-five in number, are all that I have been able to collect after an extended search through the medical literature of this century. Admitting that I may have omitted to note some of the published cases, and admitting that many cases have not been published, the coincidence of pregnancy and erysipelas must still be a rare one.

At the meeting of the American Gynæcological Society, the discussion which followed Campbell's account of such a case¹ was conspicuous for the lack of personal experience detailed. Only one person present—Dr. Lyman—had seen a similar case.

Hervieux² reports but two cases observed during a practice of a number of years.

Witzel³ saw it but twice in five hundred and sixty-eight cases.

Winckel⁴ saw it three times in one thousand and eleven cases.

In one thousand cases published by Coates,⁵ the complication did not arise.

The records of the epidemics of puerperal fever following erysipelatos infection present an entirely different class of cases, cases in which a large and open wound, the uterus itself, has absorbed poison in a manner similar to absorption by other wounds; while in the cases mentioned above these conditions did not exist.

I have designated this appearance of erysipelas during pregnancy a coincidence, for it can scarcely be dignified with the name of "puerperal erysipelas" as proposed by Hervieux. Its rarity, the fact that it may appear at any period of pregnancy, the fact that it only under certain conditions leads to uterine inflammation, and the fact that it follows no law in

¹ Trans. Am. Gy. Soc. 1881, p. 244.

² Gaz. Méd. de Paris, 1865, p. 40.

³ Berliner klin. Wochensch. No. 28, July 11, 1881.

⁴ Archiv f. Gynäk. No. xiii. p. 387.

⁵ Brit. Med. Journ. 1882, vol. 1. p. 1148.

No.	By whom reported.	Period of pregnancy.	Variety and situation of the erysipelas.	Time of premature labor.	Condition of child.	Condition of mother.	Remarks.
1	Campbell. Trans. Am. Gyn. Soc., 1881, p. 244.	Eighth month of seventh pregnancy.	Cutaneous; of face.	Six days later.	Child living and healthy.	Left bed on 9th day, well.	
2	Same.	Advanced stage of first pregnancy.	Cutaneous; of face.	Not stated.	Not stated.	Puerperal peritonitis and death.	
3	Lynan. Trans. Am. Gyn. Soc., 1881, p. 244.	Not stated.	Not stated.	Not stated.	Not stated.	Recovery.	
4	Hill. Month. Journ. Med. Sci., 1850, p. 269.	Seven months.	Not stated.	Not stated.	Born with marks of erysipelas.	Death same day from malignant puerperal fever.	This patient was nursing her father and mother who were ill with erysipelas—the former with phlegmonous variety of the hand and arm. Other cases of puerperal fever followed.
5	Am. Journ. Med. Sci., July, 1850. Same.	Near full term.	Cutaneous; of face.	Two days later.	Born with erysipelas, from which it died one week later.	Recovery.	Although this case recovered, the midwife that attended it produced puerperal fever in the next case of labour she attended, presumably by transfer of erysipelas poison.
6	Hervieux. Gaz. Méd. de Paris, 1855, p. 40.	Eight months.	Cutaneous; of face.	Two days later.	Living and healthy.	Left hospital two wks later.	
7	Same.	Eight and a half months.	Cutaneous; of face and entire neck.	Five days later.	Living and healthy.	Erysipelas lasted ten days; recovery.	
8	Witzel. Berl. Klin. Wochenschr., No. 28, July 11, 1881.	Seven months.	Cutaneous; of face.	Did not abort; went into full term.	Living and healthy.	No bad symptoms.	
9	Reid. Br. Med. Journ., May 16, 1874, p. 647.	Last weeks of pregnancy.	Cutaneous; of face and head.	Two days later.	Living and healthy.	Recovery in ten days.	After delivery erysipelas increased in extent and severity; on third day change for the better.
10	Same.	Not stated.	Cutaneous; left arm and part of left side.	Not stated.	Not stated.	Recovery.	
11	Alison. Related by Kneeland. Am. Journ. Med. Sci., April, 1846, p. 324.	Three months.	Of breast.	Not stated.	Not stated.	Puerperal fever and death.	
12	Elsdale. Assoc. Med. Journ., Feb 18, 1853, p. 148.	Fifth month of seventh pregnancy.	Cutaneous; of face, head, and neck.	Seventeen days later.	Not stated.	Recovery; no bad symptoms.	This case was followed, by several cases of puerperal fever, and the attendant upon one of the cases contracted erysipelas of the face from which she died.
13	Scholefield. Lancet, June 8, 1867, p. 728.	Not stated.	Cutaneous; of face, neck, and scalp.	Not stated.	Living and healthy.	Recovery.	The erysipelas disappeared as the labour progressed, and when the child was born there was no trace of redness.
14	Holthouse. Med. Times and Gaz., April 3, 1868, p. 355.	Ninth month.	Left leg, foot, and under surface of thigh. Phlegmonous.	Twelve days later.	Living and healthy.	Recovery.	

No.	By whom reported.	Period of pregnancy.	Variety and situation of the erysipelas.	Time of premature labor.	Condition of child.	Condition of mother.	Remarks.
15	Crawford. <i>Am. Journ. Med. Sci.</i> , Oct. 1873, p. 442.	Last days of pregnancy.	Pleuronous; hand and forearm; pus in metacarpophalangeal joint.	Not stated.	Living and healthy.	Died five days later with all the symptoms of puerperal fever.	Epidemic erysipelas was prevalent at the time. Great care was taken to prevent spread of inflammation by actual contact. When the erysipelas left the hand and arm peritoneal inflammation occurred.
16	Stewart. <i>Br. Med. Journ.</i> , Sept. 5, 1874, p. 305.	Ninth month.	Cutaneous; of scalp and face.	Twenty-six hours later.	Living and healthy.	Recovery.	
17	Hetherly. <i>Br. Med. Journ.</i> , April 17, 1875, p. 503.	Far advanced in tenth pregnancy.	Cutaneous; of scalp.	Three days later.	Living and healthy.	Recovery.	The midwife that attended this case attended others with no bad results following.
18	Smith. <i>Lancet</i> , July 31, 1876, p. 187.	Far advanced in pregnancy.	Throat and fauces.	Twenty-four hours later.	Died nine days later of icterus neonatorum.	Recovery in five days.	Daily rigours, and some abdominal tenderness until fifth day, when the erysipelas left her.
19	Ford. <i>Br. Med. Journ.</i> , June 2, 1877, p. 677.	Near full term.	Cutaneous; of face.	Two days later.	Living and healthy.	Recovery in three days.	Flow of milk early established. The child showed no repugnance to taking it.
20	Fry. <i>Br. Med. Journ.</i> , July 21, 1877, p. 71.	Seven months.	Cutaneous; of face.	Three days later.	Living and healthy.	Recovery.	Child was put to the breast ten days after the departure of the erysipelas.
21	Athill. <i>Am. Journ. Med. Sci.</i> , Oct. 1877, p. 586.	Not stated.	Cutaneous; of face.	Not stated.	Not stated.	Probable recovery.	Of ten puerperal women in adjoining wards, nine were attacked with fever and died. The only patient not attacked was a case of abortion at the third month.
22	Godfrey. <i>Br. Med. Journ.</i> , Jan. 11, 1879, p. 67.	Seven and a half months.	Cutaneous; of head and face.	Twelve hours after chill and twelve hours before appearance of eruptive.	Not stated.	Recovery.	Commenced to nurse child on the third day.
23	M. Amozan. <i>La France Med.</i> , 1879, p. 234. Phila. <i>Med. Times</i> , June 7, 1879, p. 231.	Third month.	Head and neck; cutaneous; disappeared in 4 days; a few days later appeared again.	Soon after second attack.	Not stated.	Died two weeks later of puerperal fever.	
24	Jones. <i>Bost. Med and Surg. Journ.</i> , vol. cxix. 1883, p. 293.	Eight months.	Cutaneous; of face.	Two days after chill.	Living and healthy.	Recovery.	No redness of integument noticed until labour commenced. Erysipelas lasted ten days.
25	Wardwell.	Three months.	Cutaneous; face and back.	Two days later.		Recovery.	

the time of its appearance and disappearance, place it in the same category with other eruptive diseases attacking a pregnant woman; in other words, it is but a chance complication. In analyzing the twenty-five cases in the above table it will be seen that in those (20) in which the stage of pregnancy when erysipelas appeared is mentioned, it occurred at all periods from the 3d to the 9th month, viz:—

3d month, 3 times.	8th month, 4 times.
5th “ 1 time.	9th “ 8 times.
7th “ 4 times.	

The majority occurred during the later periods of pregnancy.

In all but one case (8) premature delivery followed at periods varying from 12 hours before to 17 days after, the majority being in the course of the first 48 hours after the appearance of the blush. In two cases (22, 24) labour came on in the interval between the initial chill and the first reddening of the integument. Of the 25, 20 recovered without uterine complication, and 5 died. A mortality of 20 per cent. The question now arises why did a fatal result ensue in these five cases? An attempt to answer this question necessitates a comparison of the case as regards the situation and variety of the erysipelas and the form of treatment pursued.

And, in the first place, is the situation of the erysipelas to be taken into account in forming a prognosis?

Hervieux states that the tendency of erysipelas complicating pregnancy is to cause abortion, but that the cases recover without puerperal fever. The two cases upon which he apparently bases this statement were both cases of facial erysipelas. In the table, 19 were cases of erysipelas of the face alone, or of the face, neck, scalp, and throat. Of these, 2 died, or 10.5 per cent.

Of the remaining cases (6), in two there is no mention of the situation of the erysipelas; in four it was of other portions of the body; of the latter, 2 died, or 50 per cent.

But although the percentage of deaths seems from this statement to be so much greater in erysipelas of the trunk and extremities than in that of the face, I can scarcely believe that the difference is as great as it appears; for a death-rate based upon a small number of cases is never a fair one; and in one of these cases (15), at least an element existed which may have had a contributing force, *i. e.*, the presence of pus. One of the most severe cases (14), and one apparently most dangerous, in which the erysipelas attacked the thigh, was followed by no bad result.

This conviction receives a further confirmation from the fact that in the erysipelas of puerperism, there appears to be no law of situation which determines its fatality. Hervieux mentions 4 such cases of erysipelas of the nates and vulva, two recovered. Sidey¹ relates a case of recovery, the erysipelas being facial.

¹ Edin. Med. Journ., vol. vii. p. 88.

Thorburn¹ details a case of severe phlegmonous erysipelas of the thigh, in which the woman nursed her baby during its entire course.

On the other hand, Lühe² gives a case of facial erysipelas attacking a woman two days after delivery, and later setting up puerperal fever; and Hugenburger³ gives 15 cases with 7 deaths, the mortality evidently not depending upon the situation of erysipelas.

Does then the *variety* of the erysipelas as distinguished by us play any important role in determining its fatality? Thorburn⁴ infers that the phlegmonous variety is most often efficient in causing puerperal fever. In the table, only two cases are of the phlegmonous variety; both caused abortion. In the one recovery took place, in the other uterine inflammation and death. On the other hand, two cases of facial erysipelas ended in death. While this is manifestly too small a number of cases upon which to base a theory, it is interesting to note the varieties of the erysipelas from which the epidemics of puerperal fever have taken their origin. In the great number of instances recorded by Kneeland,⁵ the form of erysipelas was mainly phlegmonous in character. Hill⁶ gives two instances of erysipelas followed by puerperal fever; in the one originating in a phlegmonous erysipelas of the hand; in the second in a cutaneous erysipelas of the face.

Dr. Dutcher⁷ mentions a case of phlegmonous erysipelas followed by 7 cases of puerperal fever directly traceable to it; while Elsdale transferred the poison of cutaneous facial erysipelas to 3 puerperæ, 2 of whom died.

Alderson⁸ attributes 3 cases of puerperal fever to conveyance of contagion by himself after handling a severe case of erysipelas of the scrotum; while 9 cases followed the introduction of a single case of facial cutaneous erysipelas into the wards of the Rotunda⁹ Lying-in-Hospital, and these instances might be multiplied. In this connection, Holthouse says,¹⁰ in discussing his case, "the occurrence of the puerperal state in a woman affected with phlegmonous erysipelas might be looked upon as a serious complication and as offering but small prospect of recovery to the patient. This case illustrates the importance of drawing a distinction between the many forms of disease which are doubtless as distinct in their origin as typhoid fever and roseola and which are, nevertheless, all confounded together by having the same name applied to them."

If then we would base our prognosis upon the appearance of the erysip-

¹ Brit. Med. Journ., August 11, 1883, p. 260.

² Archiv für Gynäkol., No. xi. p. 205.

⁴ Loc. cit., note to his article.

⁵ Am. Journ. Med. Sci., April, 1846, p. 324.

⁷ Ibid., 1856.

⁹ Am. Journ. Med. Sci., Oct. 1877, p. 586.

¹⁰ Med. Times and Gaz., April 3, 1869, p. 355.

³ Ibid., No. xiii. p. 387.

⁶ Ibid., July, 1850.

⁸ Brit. Med. Journ., Aug. 11, 1883.

elas it would seem that there are no reliable data upon which to proceed. The mere fact that the cellular tissue has become involved or that pus is present is of no value in forecasting the ultimate result. While it is probable that a case of erysipelas of the trunk and of the phlegmonous variety is more dangerous than a case of erysipelas of the face and of the cutaneous variety, there are no superficial appearances from which we can decide that one case is of a grave import while another is not. There are some subtler and less easily defined influences at work which in the one instance make erysipelas complicating pregnancy essentially harmless, and in another lead to a train of most disastrous sequelæ. Else why did the case of Hothouse recover?

Why in the interesting case reported by Egan¹ was there no puerperal fever, although all the conditions for a direct transfer of poison from phlegmonous erysipelas to a puerpera were present?

Or why, on the contrary, were the apparently harmless cases of facial erysipelas reported by Athill² and Elsdale³ followed by such unfortunate results?

If we do not admit variety of poison, we must certainly admit other influences inappreciable by the senses: either peculiar atmospheric conditions, or the relationship, whatever it may be, between erysipelas and puerperal fever, so strongly insisted upon by Minor,⁴ and as strongly denied by Matthews Duncan,⁵ or something remote from either. But this portion of the question has been a subject of discussion for a number of years, and each side still claims its adherents. While it is not the object of this paper to discuss it further, these several factors must not be lost sight of in forming a prognosis. 1. Whether the case be sporadic or one of a number. 2. Whether the erysipelas prevailing at the time be of a virulent type or not. These circumstances, I imagine, play a more important role than either the location or variety of the erysipelas. In explanation of the good result obtained in Campbell's case, Dr. Mary Putnam Jacobi⁶ ingeniously suggested that the erysipelas being a disease of the lymphatics confined itself to that system without affecting the blood. In five of the above reported cases, however, it *did* produce uterine inflammation; and it is also interesting to note that in one of the cases⁷ in which there was no puer-

¹ N. Y. Med. Journ., xxii., Nov. 11, 1882, p. 556. He relates that he had a case of severe phlegmonous erysipelas, which he incised and evacuated pus. He washed his hands with soap and water, and five hours later delivered a woman, without having taken the precaution to disinfect his hands. No uterine symptoms followed.

² Loc. cit.

³ Association Med. Journ., Feb. 18, 1853, p. 148.

⁴ Erysipelas and Child-bed Fever, Cincinnati, 1874.

⁵ Edin. Med. Journ., No. xxi. p. 744.

⁶ Discussion following presentation of Campbell's case. Trans. Am. Gy. Soc., 1881, p. 244.

⁷ No. 5.

peral fever, the child was born with marks of erysipelas, showing that the latter was by no means a mere "cutaneous explosion." Reid¹ suggests in a similar case that "the poison having been located before labour came on remained so, and wore itself out without invading the uterus or the system at large;" in other words, "erysipelas and puerperal fever being the same diseases, the attack was a prophylactic against the severer form of the diseases." But, here again, as Reid himself suggests, one attack of erysipelas is by no means a prophylactic against another, and the cases on record in which it did not act as a prophylactic are sufficiently numerous to lead one to doubt the accuracy of the explanation.

There is one modifying influence which must be taken into account in considering the above statistics, and that is the influence which treatment has had in changing the course of the disease. Unfortunately the details of many of the cases are so meagre that no result can be arrived at as to whether the treatment has been efficacious, or whether too active interference on the part of the attendant has resulted in direct inoculation of the uterus with erysipelas poison. It seems to me that this one factor of direct inoculation is a most important one in determining the future course of the disease. That the direct transfer of erysipelas poison from an individual to a lying-in woman is possible is undoubted; that women having erysipelas and becoming puerperæ may have puerperal fever, the above statistics show: but whether as the result of a direct transfer of the poison to the uterus or to a metastasis it is impossible to say.

Assuming that in the majority of the cases direct inoculation of the uterus took place, the further condition of virulence of poison must have been present. For, that the poison is not always easily absorbed the experience of Eagan proves, and from a perusal of the cases of recovery given in the table, it is probable, for aught said to the contrary, that there was ample opportunity for absorption of poison by the uterus, had it been so disposed, the happy issues being the result of mildness of attack rather than of any measures used to prevent the spread of the disease. But, even if the tendency of many of the cases is to recover, it is logical to direct treatment toward shutting out this possible mode of infection.

I was inclined, after the recovery of my case, to give the most credit to the intra-uterine douches which were administered in conjunction with large quantities of quinine, but Campbell gives all credit to quinine, which he used without the douches. Both cases would probably have recovered without the employment of any form of treatment; but even assuming this to have been possible, the indications for treatment were present in both. Especially would intra-uterine douches be necessary in such a case as my own, in which manual exploration of the uterus was imperative, and where the air of the room was filled with the emanations of the other erysipelas

¹ Brit. Med. Journ., May 16, 1874, p. 647.

patients. And while I can scarcely believe that the patient would have recovered had the same conditions been present during its progress as in Hill's case, or as in the case related in the *Association Medical Journal*, January, 1854, p. 92,—where a practitioner conveyed erysipelas to a puerperal woman three days after he had visited the erysipelas case, and after a rigid disinfection of hands and clothes.—yet the treatment would prove efficacious in overcoming poison of a less virulent type, perhaps in such a case as that related by Smith,¹ concerning which he asks: "Is it possible that the speedy exhibition of quinine to cinchonism and the use of an antiseptic injection were the means of warding off in this case an impending attack of puerperal fever?" The following is a recapitulation of the results obtained from a review of these cases.

1. Erysipelas may attack a pregnant woman at any period of pregnancy, especially during its later stages.
2. The erysipelas is most often sporadic.
3. The situation of the erysipelas may be on any portion of the body, usually upon the face.
4. The variety of the erysipelas may be either cutaneous or phlegmonous, usually the former.
5. Premature labour takes place almost invariably, and usually within forty-eight hours after the initial chill.
6. The tendency of such cases is to recover without uterine inflammation.
7. It is impossible to base a prognosis upon either the position or the variety of the erysipelas.

One further circumstance has a practical bearing, *i. e.*, the time at which the child can be put to the breast. In the case of severe phlegmonous erysipelas related by Thorburn, the child nursed during its entire course; no bad results followed. In Case 19 the child was put to the breast on the third day; no bad symptoms. In Case 20 the child did not take the breast until ten days after the disappearance of the erysipelas.

But the following case (No. 13) related by Scholefield would show that putting the child to the breast, even after disappearance of the erysipelalous blush, is by no means without danger. He says the erysipelas disappeared as the labour progressed, and when the child was born there was no trace of redness. There was no recurrence of the disease, and the mother recovered well. The child was put to the breast four days later, although Scholefield had forbidden such action. It began to have erysipelas of the right thumb, which spread over the arms and body, and which later resulted in the child's death.

Scholefield draws from this occurrence the following conclusions:—

1. The secretion of the mother contained a poison.
2. This poison existed in the blood, and although it produced no apparent symptoms in the mother, it was yet potent enough to produce fatal erysipelas in the child.

¹ Lancet, July 31, 1875, p. 187.

ARTICLE IV.

IRRITATION OF THE SEXUAL APPARATUS AS AN ETIOLOGICAL FACTOR IN THE PRODUCTION OF NASAL DISEASE.¹ By JOHN N. MACKENZIE, M.D., of Baltimore, Md., Surgeon to the Baltimore Eye, Ear, and Throat Charity Hospital.

*"Balnea, vina, Venus corrumpunt corpora nostra,
At faciant vitam, balnea, vina, Venus."*

THE evil effects of undue excitation or disease of the generative apparatus upon the organs of sight and hearing are well known to specialists in these departments. That immoderate indulgence in venery may lead to derangements of the former, was familiar to Aristotle,² and that the fathers of medicine recognized some mysterious connection between the ear and the reproductive functions is evident from the testimony of Hippocrates.³ Over two centuries ago, Rolfin⁴ wrote: "*Qui partibus genitalibus abutitur, et sexto præcepto vim infert, male audit,*" a proposition which has been fully established by the clinical experience of to-day.

The intimate relationship between the genital organs and those of the throat and neck seems to have attracted the special attention of the ancients. Thus Aristotle⁵ clearly defines the changes in the voice at puberty, and the effect of castration on its qualities.⁶ Its harsh, irregular, and discordant character during the maturation of the sexual functions was furthermore affirmed to be more conspicuous in those who attempted the early gratification of the sexual appetite. The observation that, during coitus, the voice becomes rougher and less acute, led the phonasci or voice-trainers to infibulate, or confine the penis with bands and fetters, to preclude indulgence in wantonness,⁷ whilst the popular idea of the injurious effect of repeated coition upon the singing voice is reflected in the epigram of the Roman satirist:—

*"Cantasti male, dum fututa es, Ægle.
Iam cantas bene; basianda non es."*⁸

The supposed influence of sexual excitement upon the external throat is likewise apparent from the ancient nuptial ceremonial. Before the vir-

¹ Read Jan. 15, 1884, before the Baltimore Academy of Medicine.

² Aristot. opera omnia græco-latin. Parisiis, 1854. De animalium generatione, lib. ii., cap. 7.

³ Opera omnia, Ed. Kühn, Lipsiæ, 1827, tom. i. p. 562.

⁴ Ordo et methodus generatione dicatarum partium, per anatomen, cognoscendi fabricam. Jenæ, 1664, part i. cap. vii. p. 32.

⁵ Op. cit. De animal. historiâ, lib. vii. cap. i.

⁶ Op. cit. De animal. generatione, lib. v. cap. 7.

⁷ J. Riolani Anthropographiæ, lib. ii. cap. 34, p. 303, Francofurt, 1626. Riolanus quotes from the *Museum* of Albertus Magnus the case of a girl, sent to fetch wine from a public house, who was seized and ravished on the road, and who found, in attempting to sing on her return, that her voice had changed from acute to grave.

⁸ Martial, Epig. Lib. I. xcvi. ad Æglen fellatricem.

gin retired with her lord on the wedding night, it was customary to measure her neck with a tape, and again on the following morning. If the neck showed an increase in size, it was taken as a certain indication of defloration, whilst, if the two measurements were equal, she was supposed to have retained her virginity. This curious test, which has also been utilized to establish the fact of adultery, has been transmitted to us in the *Epithalamium* of Catullus:—

“*Non illam nutrix, oriente, luce revisens,
Hesterno collum poterit circumdare filo.*”¹

Whilst, therefore, the above historical facts point to the early recognition of the relationship between over-indulgence of the sexual powers and morbid conditions of the eye, ear, and throat, the special part which it plays in the production of nasal disease seems to have been heretofore overlooked.

In the *Ayurvēda*, the sacred medical classic of the ancient Hindus, a work of fabulous antiquity, the causes of common catarrh are thus tersely defined:—

“*Uoris concubitus, capitis dolor, fumus, pulvis, frigus,
Vehemens calor, retentio urinae sæcumque statim
Catarrhi causæ dictæ sunt.*”²

Although indulgence in venery heads the list, it is highly probable that its real influence was unrecognized, and that it is given as an etiologi-

¹ Epithal. Pelei et Thetidos, lxiv. Catulli op. omn., Lond., 1822, p. 230. This phenomenon was variously attributed to the dilatation of the vessels of the neck by the semen, a portion of which, according to the Hippocratic doctrine, flowed down from the brain during intercourse, and to the general agitation of the vascular system, and especially the arterial and venous trunks of the throat, during the excitement of the sexual act.

² *Susrutas Ayurvēdas : id est Medicinæ Systema*, a venerabili D’hanvantare demonstratum a suo discipulo compositum. Translated from the Sanskrit into Latin, by Franciscus Hessler, Erlangen, tom. iii. cap. xxiv. p. 44, 1850. (Library Surg. Gen. Office.)

As matters of historical interest, I may here add, that the earlier physiognomists laid great stress upon the size and form of the nose as an indication of corresponding peculiarities in the penis. A nose, for example, that was large and firm was looked upon as an index of a penis acceptable to women, and hence it was that the licentious Heliogabalus only admitted those who were *nasuti*, i. e., who possessed a certain comeliness of that feature, to the companionship of his lustful practices. (*Vide* Ælius Lampridius in vita Antonii Heliogabalis, in Hist. August., etc. Beponti.) It was possibly the supposed influence of an elegant and handsome nose as an incentive to illicit amours, that led to the well-known custom of amputation of that organ in adulterers (Comp. Virgil, *Æneid*, vi. 497—“*truncas inhonesto vulnere nares*”), whilst in women detected in the act, the disfigurement thereby produced was intended as a perpetual reminder of their shame. (*Vide* Diodorus Siculus in *Bibliothecæ Historicæ*. Paris ed., 1854, tom. i. lib. i. cap. lxxvii. (5), p. 64, on the customs and laws of the Ægyptians.) Finally, Bartholini (*Anatomia Reformata*, de Naso; also Lond. ed., bk. iii. chap. x. p. 150) tells us that Michael Scotus pretended to be able to diagnose virginity by touching the cartilage of the nose.

cal factor simply in accordance with the seemingly prevalent idea which pervades the Indian, Shastras, that venery and confinement of the bowels lay at the root of most diseases. Indeed, the striking frequency with which these conditions are encountered as the alleged promoters of morbid states almost compels the inference that the religious members of this haughty race must have been the most constipated and libidinous of men.

To render the relationship which I propose to call attention to more intelligible, it is necessary to recall the anatomical fact, that in man, covering the middle and inferior turbinated bones and a portion of the septum, is a structure which is essentially the anatomical analogue of the erectile tissue of the penis. Like it, this body is composed of irregular spaces or erectile cells, separated by trabeculæ of fibrous connective tissue containing elastic and muscular fibres, the latter element being not as prominent and well marked as in the cavernous bodies of the generative organ. Under the influence of *ab extra* irritation, or as the result of psychical impressions, erection of this tissue takes place, the dilatation of its cells being, in all probability, under the direct dominion of vaso-motor nerves derived through the spheno-palatine ganglion. It is the temporary orgasm of these bodies that constitutes the anatomical explanation of the stoppage of the nostrils in acute coryza, and their permanent enlargement is the distinctive feature of hypertrophic nasal catarrh. This erectile area is, moreover, as has been elsewhere shown,¹ especially concerned in the evolution of the many curious reflex phenomena which are observed in connection with nasal affections. Indeed, the changes which it undergoes seem to lie at the foundation of nasal pathology, and furnish the key not only to the correct interpretation of nasal disease, but also to many obscure affections in other and remote organs of the body.

That an intimate physiological relationship exists between certain portions of the reproductive system and the erectile nasal tissue is sufficiently evident from the following facts:—

(1) That in a certain proportion of women, whose nasal organs are healthy, engorgement of the nasal cavernous tissue occurs with unvarying regularity during the menstrual epoch, the swelling of the membrane subsiding with the cessation of the catamenial flow. I have been able to satisfy myself of the correctness of this statement by direct ocular inspection of these bodies, before, during, and after the monthly period. Thus, I have seen the engorgement of the turbinated bodies take place at the onset of the menstrual molimen, reach its acme during the full establishment of the process, and disappear with the subsidence of the ovarian excitement. In a young lady under my care who menstruated in an irregular manner, occasionally omitting a monthly period without exter-

¹ This Journal, July, 1883, p. 106.

nal flow, at such times the nasal erectile bodies became swollen and turgid as in the periods when all the external evidences of menstruation were present. This monthly turgescence of the nasal corpora cavernosa may be bilateral, or confined to one side, the swelling appearing first in one side and then in the other, the alternation varying with the epoch. This periodical erection may be inconsiderable and give rise to no inconvenience, or, on the other hand, the swollen bodies may occlude the nostril and awaken phenomena of a reflex nature, such as coughing, sneezing, etc., and in view of the heaviness of the head, the intimate vascular connection between the erectile spaces and the cerebral sinuses and the filling of the former in acute coryza, it seems legitimate to suppose that the headache which so often accompanies the consummation of the menstrual act may in some cases be partially, if not entirely, due to erection of the nasal turbinated structures. Whether the phenomena above described occur during pregnancy at periods corresponding to those of the menstrual flow, I am unprepared to say, as I have not as yet had sufficient opportunity to investigate the subject.

(2) The presence of vicarious nasal menstruation. It is a familiar fact that women are occasionally found in whom the menstrual function is established by a discharge of blood from the nostrils. This hemorrhage may be replaced afterwards by the uterine flow, but sometimes continues throughout the menstrual life of the individual. In the latter case, some malformation or derangement of the sexual apparatus seems to be responsible for the nasal flow. Epistaxis also occurs, now and then, from the suppression of the normal flux. This was considered a favourable sign by Hippocrates,¹ and by Celsus² who followed closely in his footsteps. These hemorrhages are, moreover, not confined to women, but make their appearance not infrequently in boys at puberty, upon the full development of their sexual powers.

(3) The well-known sympathy between the erectile portions of the generative tract and other erectile structures of the body. There is no reason why the sexual excitement which leads to congestion and erection of these organs may not, under similar circumstances, cause engorgement of the nasal erectile spaces, and that such is the case, in some instances, I am convinced.

(4) The occasional dependence of phenomena referable to the nose during sexual excitement, either from the operation of a physiological process, the erethism produced by amorous contact with the opposite sex, or during the consummation of the copulative act. The congestion and consequent irritation of the sensitive area thus brought about probably furnish

¹ Op. omn. Ed. Kühn. Lipsiæ 1827, tom. ii. p. 174. De morbis, lib. i. and Aph. sect. 5, Art. 33.

² De medicina. Rotterodami, 1750, lib. ii. cap. 8.

the explanation of the sneezing which has been observed during the performance of the latter.¹

(5) The reciprocal relationship between the genital organs and those of the nasal apparatus is furthermore illustrated by the occasional dependence of genito-urinary irritation upon affections of the nasal passages. Retarded sexual development, too, may possibly depend upon the coexistence of nasal disease.²

(6) It is, finally, quite possible that irritation and congestion of the nasal erectile tissue precede, or are the excitants of the olfactory impression that forms the connecting link between the sense of smell and erethism of the reproductive organs exhibited in the lower animals and in those individuals whose amorous propensities are aroused by certain odours that emanate from the person of the opposite sex.

These facts point conclusively to an intimate physiological association between the nasal and reproductive apparatus, which is partially explicable on the theory of reflex or correlated action, partially by the bond of union which exists between the various erectile structures of the body. That a relationship exists by virtue of which irritation of the one reacts upon the circulation, and possibly, nutrition of the other, is accordingly rendered highly probable by the evidence of clinical observation. If this excitation be carried beyond its physiological limits, there comes a time, sooner or later, when that which is a normal process becomes translated into a pathological state, according to a well-known law of the economy. Hence it is *à priori* conceivable, and eminently probable, not only that stimulation of the generative organs, when carried to an excess, may become an etiological factor in the production of congestion and transient inflammation of the nasal passages, and especially of their cavernous tissue, but that repeated and prolonged abuse of these organs may, by constant irritative influence on the turbinated tissue, become the starting-point of chronic changes in that structure.

The following data, derived from personal clinical observation, may possibly throw some light upon the subject.

(1) In a fair proportion of women suffering from nasal affections, the disease is greatly aggravated during the menstrual epoch, or when under the influence of sexual excitement. Cases are also met with where inflammatory conditions of the nasal passages make their appearance only at the monthly period, or, at least, are only sufficiently annoying at that time to call for medical attention. Occasionally the discharge from a nasal catarrh will become offensive at the menstrual epoch, losing its dis-

¹ Van der Wiel, in his *Observationes Rares de Médecine, de Chirurgie et d'Anatomie* (French trans.) (quoted by Deschamps. *Traité des mal. des fosses nasales et leur sinus*. Paris, 1804, p. 88) speaks of a man of sanguine temperament, who every time he caressed his wife, sneezed three or four times; Elsberg (*Archives of Laryngology*, Oct. 1883) refers to a case of nasal catarrh where sneezing followed or accompanied coitus, and a similar case has been communicated to me by Dr. R. Tilley, of Chicago.

² *Vide* case referred to by Elsberg (*loc. cit.*).

agreeable odour during the decline of the ovarian disturbance. In most cases of ozæna, the fœtor is much more pronounced, at times corresponding to those of the uterine flow.¹

(2) Excessive indulgence in venery seems to have a tendency to initiate inflammation of the nasal mucous membrane, or to aggravate existing disease of that structure. There are men, for example, who suffer from a coryza after a night's indulgence in venereal excesses, and the common catarrhal affections of the nose are undoubtedly exaggerated by repeated and unnatural coition.²

(3) The same is true in regard to the confirmed habit of masturbation. The victims of this vice in its latter stages are constantly subjected to a discharge from the nostrils and perversion of the olfactory sense, which are simply the outward expression of chronic nasal inflammation.

(4) The coexistence of uterine or ovarian disease exerts sometimes an important influence on the clinical history of nasal inflammation. This fact has been illustrated in practice in cases in which the nasal affection has resisted stubbornly all treatment, and in which it has only been relieved upon the recognition and appropriate treatment of disease of the generative apparatus.

These observations, therefore, encourage the belief, if they do not establish the fact, that the natural stimulation of the reproductive apparatus, as in coitus, menstruation, etc., when carried beyond its normal physiological bounds, or pathological states of the sexual apparatus, as in certain diseased conditions, or as the result of their over-stimulation from venereal excess, masturbation, etc., are often the predisposing, and occasionally the exciting causes of nasal congestion and inflammation. Whether this occurs through reflex action, pure and simple, or as the sequel of an excitation in which several or all of the erectile structures of the body participate, the starting-point of the nasal disease is, in all probability, the repeated stimulation and congestion of the turbinated erectile tissue of the nose. It is highly probable that this erectile area, so sensitive to reflex producing impressions, is the correlative of similar vascular areas in the reproductive tract, and that the phenomena observed may accordingly be explained by the doctrine of reflex or correlated action.

¹ Since writing the above, I find that this exaggeration of the odour in ozæna is mentioned by Trousseau (Clin. Med., vol. iii. p. 70, New Syd. Soc. Ed.).

² Among the cases that suggested the investigation of this subject was that of a gentleman whom I met several years ago abroad, who always suffered from coryza after a night spent in venereal pleasures. It is interesting in this connection to recall the admonition of Celsus to abstain from warmth and women at the commencement of an ordinary catarrh. (Op. cit., lib. iv. cap. 2, § 4, "*ubi aliquid ejusmodi sentimus, protinus abstinere a sole, a balneo, a venere debemus.*") Hippocrates, on the other hand, relates the following case: "*Timochari hieme distillatione in nares præcipue vexato post Veneris usum cuncta ressecata sunt, lassitudo, calor et capitis gravitas successit, sudor ex capite multus manabat.*" Op. cit., De morbis vulgaribus, lib. v. (tom. iii. p. 574).

ARTICLE V.

CORTICAL LESIONS OF THE BRAIN. A COLLECTION AND ANALYSIS OF THE AMERICAN CASES OF LOCALIZED CEREBRAL DISEASE. By M. ALLEN STARR, A.M., M.D., Attending Physician, New York Dispensary; Assistant in New York Polyclinic, Department of Nervous Diseases.

THE localization of brain functions has been raised from the level of an hypothesis to that of a definitely ascertained fact within the past ten years. Meynert was the first to discard the doctrine of Flourens, that the brain acted as a whole, and on anatomical grounds declared that different portions possessed different powers. The study of aphasia led French observers independently to the same result. Fritsch and Hitzig in Germany, and Ferrier in England, arrived at a similar conclusion soon after by means of their well-known physiological experiments upon animals, and the results reached by them have been confirmed in a most striking manner by Munk, Dalton, and others. But while anatomical study, demonstrating a connection between various organs of the body and definite regions of the surface of the brain, may furnish grounds for *à priori* reasoning as to the function of those regions; and while physiological experiments upon animals may afford valuable suggestions as to the probable effect of limited brain disease in man, an accurate determination of the question of localization can only be reached by a study of clinical cases. The appreciation of this fact has led Charcot, Ferrier, Nothnagel, Exner, Wernicke, and others to collect the cases on record in which a limited area of disease, whose position was determined by a careful autopsy, had given rise to definite symptoms.¹ From the comparison and classification of these cases, certain general conclusions have been reached, and it is now possible to refer many symptoms occurring in the course of brain disease to a destruction of a definite area of the surface.

A generalization, in order to be reliable, must rest upon the analysis of a large number of facts. The collection of these facts is the first step in the progress toward such generalization. In the collection of cases of brain disease, the foreign observers have not had access to the records published in this country. But the number of cases which have appeared

¹ Charcot, Localisation des Maladies Cérébrales, Le Progrès Médical, 1875. Ditto, Revue de Médecine, 1877. Ferrier, Localization of Brain Disease, London, 1878. Charcot et Pitres, Localisation des Maladies Cérébrales, Revue de Méd. 1879. Boyer, Recherches Cliniques sur les Maladies Cérébrales, Paris, 1879. Nothnagel, Topische Diagnostik der Gehirnkrankheiten, Berlin, 1879. Exner, Untersuchungen über die Localization der Function in der Grosshirnrinde, Wien, 1881. Wernicke, Lehrbuch der Gehirnkrankheiten, Bd. ii., iii., 1882, 1883. Benedikt, Localization der Function der Grosshirnrinde, Wiener Klinik, 1883. Charcot et Pitres, Localisation des Maladies Cérébrales, Revue de Méd. 1883. Petrina, Vrtljschr. für prakt. Heilk. 1879. Petrina, Ztsch. für Heilk. 1881-1883. Vetter, Deut. Arch. f. klin. Med. 1883, 3 und 4.

in American journals is not inconsiderable, and, when gathered and classified, they form an important addition to the data of localization. They not only confirm and strengthen the results reached abroad, but they furnish facts for new and important conclusions.

The cases here brought together are all cases of disease of the cortex of the brain. It is in the cortex that conscious mental activity goes on, and hence it is in the cortex that mental processes are to be localized. Disease of the nerve tracts, to and from the cortex, or of the ganglionic masses interspersed along those tracts, while offering an interesting field for observation, has, by general consent, been excluded from the study of localization, and belongs to another division of cerebral pathology.

In a review of the American medical literature of the past twenty-five years, nearly five hundred cases of local disease of the brain have been found. Some of these cases are of great value. Many of them are too defective, either in the record of symptoms, or in the description of the situation of the lesion, to be of any service. For, as Nothnagel has clearly shown,¹ those cases only are of use in determining the function of limited areas of the cortex in which there was a single lesion of small extent, accurately located, and of considerable duration. If the lesions are multiple, it is impossible to connect definite symptoms with each. If the lesion is of large extent, the functions of two or more areas involved cannot be distinguished. If the patient dies soon after the invasion of the disease, especially if the disease be a cerebral hemorrhage, it is impossible to separate the temporary symptoms due to shock from the permanent symptoms due to the destruction of brain-tissue. The acceptance of these conditions has excluded many interesting cases, but has enhanced the value of the results obtained from the study of those which are cited.

Cases of brain disease afford two distinct kinds of information regarding the function of the cortical areas, which may be termed positive and negative, and each is of value.² The positive evidence consists of the morbid symptoms produced by the lesion in a definite area. The negative evidence consists of the normal functions remaining when that area is diseased. For example: a lesion limited to the paracentral lobule of one side produces paralysis of the opposite leg, but does not affect the powers of speech, of hearing, or of vision. We are warranted, therefore, in concluding positively, that the motor centres for the leg lie in this area, and, negatively, that the functions of speech, hearing, and vision do not lie in this area. In the analysis of the cases here cited, both of these lines of evidence will be followed.

There are certain symptoms which are common to various kinds of disease of the brain in whatever region they are located. Such are headache, vertigo, digestive disturbances, general convulsions, coma, and optic neu-

¹ Nothnagel, *Topische Diagnostik der Gehirnkrankheiten*, s. 6.

² This distinction was first made by Exner, *loc. cit.*

ritis or choked disk. These are due either to an increase of the intracranial contents and consequent pressure, or to an interference with the normal circulation in the parts not directly affected by the disease. They give no evidence as to the exact region of the brain which is affected, and are therefore termed *general symptoms* in distinction from local symptoms which are produced by the lesion of a limited area.

The *local symptoms* consist of disturbances of motion, of sensation, of sensory perception, of memory, and of speech. In cases of brain disease in which there is no increase of intracranial pressure a causal connection between local symptoms and limited lesions is easily established. When, however, the presence of a tumour or an abscess or a clot has increased the contents of the cranium, the *direct* local symptoms due to the affection of one area must be distinguished from *indirect* local symptoms due to the incidental affection of adjacent areas by irritation or disturbance of circulation.¹ Indirect local symptoms can usually be separated from direct local symptoms if the course of a case is considered. For example, if the case is one of a gradually increasing focus of disease, a tumour or abscess, the indirect local symptoms will precede the direct local symptoms and vary in intensity, extent, and duration, while the latter are permanent. Or if the case is one of hemorrhage occurring suddenly the indirect local symptoms will gradually subside, leaving only the direct local symptoms to indicate the actual area involved. When a lesion of one area sets up a general meningitis, the general and indirect local symptoms become so extensive and prominent as to prevent an accurate determination of the local area primarily involved. For this reason cases complicated by a meningitis do not afford reliable information regarding the function of limited areas, and are excluded from this collection.

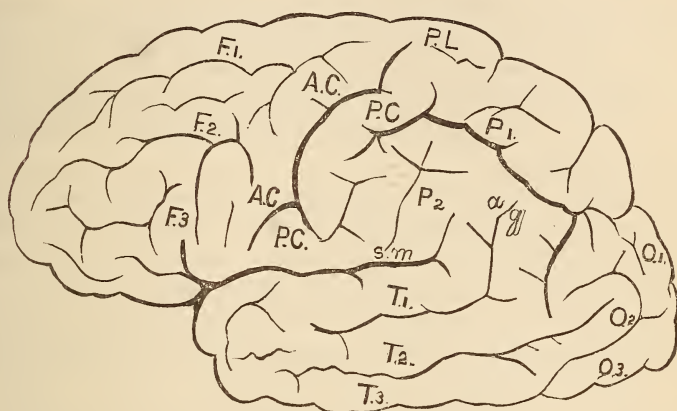
Lesions of the cortex may be pathologically divided into two classes, irritative and destructive, and each class offers important evidence for localization. An irritative lesion produces symptoms due to an increased activity of the area involved, *e. g.* spasms, convulsions, pain, paræsthesiæ, hallucinations of sight, hearing, etc., compulsory speech and delirium. A destructive lesion produces symptoms due to a loss of power in the area involved; *e. g.* paralysis, anæsthesia, blindness, deafness, loss of speech, and loss of memory. A lesion which at first irritates an area may after a time destroy it, and then the first set of direct local symptoms is followed by the second set, and a single case thus presents two distinct kinds of evidence of localization. Cases of Jacksonian epilepsy, in which one group of muscles is first convulsed and then paralyzed, afford examples of such a succession of symptoms.

The cases here collected have been classified according to the area of the cortex involved; lesions of the frontal, central, parietal, occipital, and

¹ This distinction is clearly drawn by Wernicke, *Lehrb. der Gehirnkn.*, vol. i. p. 284.

temporal regions being considered separately ; an analysis of the symptoms being made after a statement of each group of cases has been given.

A description of the anatomy of the brain is remote from the present subject, but for the purpose of reference in the study of the cases the following figure illustrating the convexity of the brain and its convolutions



CONVOLUTIONS OF THE BRAIN.

Lateral View of the Left Hemisphere, after Bischoff. From a photograph.

<i>F</i> ₁ . Superior frontal.	<i>P</i> ₁ . Superior parietal.	<i>sm</i> . Supra-marginal.
<i>F</i> ₂ . Middle frontal.	<i>P</i> ₂ . Inferior parietal.	<i>ag</i> . Angular gyrus.
<i>F</i> ₃ . Inferior frontal.		
<i>A C</i> . Anterior central.	<i>O</i> ₁ . Superior occipital.	<i>T</i> ₁ . Inferior temporal.
<i>P C</i> . Posterior central.	<i>O</i> ₂ . Middle occipital.	<i>T</i> ₂ . Middle temporal.
<i>P L</i> . Paracentral lobule.	<i>O</i> ₃ . Inferior occipital.	<i>T</i> ₃ . Inferior temporal.

is added, and its principal divisions are mentioned. The frontal lobe, whose sulci are seen to run in a general antero-posterior direction, has three prominent convolutions: the superior, middle, and inferior frontal convolutions. Posterior to this lobe two prominent convolutions, separated by the deep fissure of Rolando or central fissure, are seen extending from the vertex vertically downward to the fissure of Sylvius, and almost at right angles to the frontal convolutions. These are the anterior and posterior central convolutions,¹ which unite at their superior extremities to form the paracentral lobule. Lying posterior to the central region, and separated by the deep interparietal fissure, are two irregular collections of short convolutions extending backward to the occipital sulcus and limited below by the posterior extremity of the Sylvian fissure. These are the superior and inferior parietal lobules; and the convolution bordering the Sylvian fissure is called the supra-marginal convolution. The posterior

¹ Formerly named ascending frontal and ascending parietal convolutions.

apex of the brain is made up of the three occipital convolutions whose direction, like those of the frontal lobe, is antero-posterior. The temporo-sphenoidal lobe, divided by sulci into a number of convolutions running parallel to its long diameter, lies wholly below the Sylvian fissure, but is joined to the occipital and inferior parietal regions by short connecting convolutions of somewhat irregular shape and size.

Lying deep within the Sylvian fissure is the island of Reil, a series of five short vertical convolutions continuous above with the inferior extremities of the third frontal and both central convolutions, and below with the first temporal convolution, both of which groups of convolutions are so folded over as to cover in and conceal the island of Reil unless the fissure of Sylvius is opened.

On the median surface of the hemisphere the gyrus fornicatus borders the corpus callosum, while above it lies the paracentral lobule at the vertex. Anterior to the paracentral lobule the median surface of the first frontal convolution extends to the apex of the frontal lobe. Posterior to the paracentral lobule lie the precuneus, which forms the median surface of the superior parietal lobe, and the cuneus, which forms the median surface of the occipital convolutions.

In order to secure a uniformity of description in the location of the lesions in the cases here cited, the nomenclature just stated, which is that of Ecker, is substituted for that used by the authors quoted. In referring, therefore, to the frontal or parietal lobes it is to be understood that the central convolutions are not included.

Lesions of the frontal, temporal, occipital, and parietal regions will be first taken up, as they present no motor symptoms. Those of the central regions with the island of Reil will then be considered together, the direct local symptoms due to their disease being very numerous and marked.

I. FRONTAL LOBES.

Lesions affecting the three frontal convolutions may be classed together. Ever since the occurrence of the famous American crowbar case it has been known that destruction of these lobes does not necessarily give rise to any symptoms. That case is given in order to compare others with it.

CASE I. *Destruction by a Foreign Body.*—Male, æt. 48. A crowbar three and a half feet long, and one and one quarter inch in diameter was driven upward by a blast through the man's head, as he stood leaning forward and looking down. The bar traversed the cranium in a straight line from the left angle of the jaw to the centre of the frontal bone, just in front of the coronal suture. He was carried home, walked up stairs, and was able to relate his own history while the wound was dressed. The left eye was dull and glassy, and after seeing light dimly for nine days, he lost vision in it completely. He vomited soon after the wound was dressed, and in the evening of that day both his legs were constantly convulsed. The day after, he had much pain in the head and some difficulty of speech. Then delirium and all the symptoms of encephalitis set in, but he gradually recovered, and seven weeks after the injury was able to get up and to walk out. At this time, it was noticed that he was somewhat childish and

uncontrollable. At the end of sixteen months the wounds were healed, and the patient had recovered his health and mental vigour. A depression in the scalp, which pulsated, remained; also blindness of the left eye, with ptosis and immobility of the eyeball. He lived twelve years, being able to work as a farm labourer all the time. It was noticed that his disposition was altered, and that he was irritable, easily excitable, and emotional. His last illness was short, and was accompanied by general convulsions.

Autopsy.—The skull was obtained some time after death, and careful measurements demonstrated that the lesion must have involved the whole central portion of the left frontal lobe, and a part of the apex of the left temporal lobe, and also a small part of the right frontal lobe in its posterior part, adjacent to the longitudinal fissure. It is also probable that the anterior cornu of the left lateral ventricle was laid open. The longitudinal sinus must have been pierced. (H. J. Bigelow, *Amer. Journ. Med. Sci.*, July, 1850. J. B. S. Jackson, *Catalogue of the Warren Anat. Museum*, Boston, 1870, p. 145.)

The indirect local symptom of spasms of the legs, which occurred during the first twenty-four hours, indicates an irritation of the motor centres in the paracentral lobules. The absence of permanent paralysis, however, demonstrates the fact that the lesion did not reach the motor area. The same absence of motor symptoms is noticeable in the following cases:—

CASE II. *Bullet remaining in the Brain Four Years.*—Male, æt. 27, was shot in the head in 1874, and suffered from acute encephalitis for a short time, but then recovered. For four years the patient was perfectly well, physically and mentally. In July, 1879, after a short illness, he died.

Autopsy.—The bullet inclosed in a cyst was found lying in the white matter of the right frontal lobe in its centre. A canal ran directly through the lobe in an antero-posterior direction to the ball. It was patent throughout. Three spiculæ of bone were found near the ball. The right frontal lobe was atrophied, and fully one-third smaller than the left. (J. E. Gibson, *Med. Record*, vol. xvi. p. 540. *Nashville Journal of Med. and Surg.*, xxiv. p. 299.)

CASE III. *Bullet remaining in the Brain Three Months.*—Male, æt. 39, was wounded December 12, 1862, by a ball which destroyed the right eye and entered the brain. After three weeks, the patient was up and about in perfect health, but occasionally had a little pain over the left orbit. On February 6, 1863, he had a chill, but no cerebral symptoms developed until the 10th, when he became delirious, passed into a state of coma, and on the 15th died.

Autopsy.—The ball was found between the sphenoid bone and the orbital plate of the frontal bone. Over the ball, at the base of the left frontal lobe, was an abscess which contained two drachms of pus, and had involved the orbital convolutions. (S. W. Gross, *Amer. Journ. Med. Sci.*, July, 1873; quoted from *Circular No. 6*, S. G. O., p. 15.)

CASE IV. *Bullet remaining in the Brain Eleven Months.*—Male, æt. 32, shot himself in the forehead, March 9, 1872, and for six weeks suffered from local inflammation in the wound, after which he left the hospital cured, without any brain symptoms. In January, 1873, he began to complain of headache in the frontal region and heaviness of the head. On January 23, was admitted to the hospital and found to be stupid and listless; skin cool, and extremities cold; pulse rapid and feeble. He had incontinence of urine and feces. On the 28th, erysipelas of the head, beginning at the old scar, set in; the patient became semicomatose, and then delirious, and died February 13th.

Autopsy (12 h. p. m.).—Dura adherent to the frontal bone. On the under surface of the left frontal lobe of the cerebrum was a large sac containing six ounces of pus, and partly filling the left anterior fossa as far back as nearly to reach the Sylvian fissure. In front of it lay the bullet encysted, and several fragments of bone. The portion of the brain anterior to this was adherent to the dura. The sac was not formed by the dura, but was independent of it. The ventricles did not communicate with the sac. (R. E. Young, *Jefferson City Hospital Report*. *St. Louis Med. and Surg. Journal*, vol. x. p. 612.)

CASE V. *Foreign Body in the Frontal Lobe.*—The breech-pin of a gun four and seven-tenths inches long and one-half inch broad was forced through the right eye of a boy nineteen years old, on September 18, 1881. It broke the orbital plate, and perforating the frontal lobe of the brain to a depth of one and a half inch, remained in the nose orbit and cranium. After lying unconscious for four days, the boy came to his senses, and recovered, no brain symptoms whatever resulting from the presence of the pin. In February, 1882, he applied at the N. Y. Eye Infirmary, in order to have the deformity of his face repaired by a plastic operation. During the operation the presence of the pin was discovered, and it was removed. Suppuration of the brain followed, and collections of pus had to be evacuated by incisions into the brain, and finally by the passage of a drainage-tube through a fenestrum made in the frontal bone three inches above the right external angular process, through the brain tissue and out of the orbit. Paralysis of the entire left side, which had developed three weeks after the operation, was relieved to some degree by the through drainage, but returned in one week, and was accompanied by partial anæsthesia of the left arm. The special senses were not affected. Five weeks after the operation the boy began to be stupid, and indifferent to the state of the bladder and rectum, and then sank gradually and died. He was perfectly intelligent and conscious, though indisposed to talk, up to within two hours of his death.

Autopsy.—Around the two openings in the skull there was a hemorrhagic pachymeningitis, with adhesion of the membrane, so that no pus had entered the subdural space. Elsewhere the dura was normal. There was a purulent leptomeningitis of the base, and of the convexity around the fenestrum. The right frontal lobe was sunken in, there being a loss of substance involving the second and third frontal convolutions beneath the fenestrum, and the orbital convolutions over the opening in the orbital plate and the white matter between these two points where the drainage-tube had been passed. The interior of the right frontal lobe was destroyed and occupied by a cavity with soft sloughing walls of brain tissue. This cavity had undermined the anterior central convolution, had involved the anterior extremity of the nucleus caudatus and the adjacent internal capsule. The substance of the left hemisphere was moist. After the brain had been hardened in chromic acid it was found that the cortex of the central convolutions was normal, but that the anterior portion of the internal capsule was destroyed.—H. B. Noyes, *Amer. Journ. Med. Sci.*, July, 1882.

This case is no less remarkable than the crowbar case. The presence of the breech-pin in the brain was unknown for five months, and the great destruction of tissue in the frontal region caused no symptoms. When encephalitis set in, and advanced toward the fibres coming from the anterior central region, local symptoms at once developed, consisting of paralysis and anæsthesia in the opposite side of the body. The case illustrates the difference between lesions of the frontal and lesions of central region, in the character of the symptoms produced.

In these cases, foreign bodies entered and destroyed portions of the frontal lobe, without producing paralysis, anæsthesia, or disturbance of the special senses. Mental symptoms, which may be summed up as a deficiency of self-control, were manifest in two of the cases. In the following cases, the frontal lobes were the seat of abscesses of varying size:—

CASE VI. *Abscess of the Frontal Region.*—Female, æt. 28, had suffered for two years from occasional frontal headache. In March, 1880, symptoms of orbital abscess appeared and were relieved by opening the abscess. The wound healed perfectly. On April 4th the patient began to suffer from severe headache and vomiting, which were soon followed by general feebleness and stupor, with irregular respiration and slow irregular pulse. Patient had no fever, no convulsions, no paralysis, no aphasia, no eye symptoms, and was conscious. In this condition she

remained until April 14th, when partial paralysis of the left third nerve appeared, the eyelid drooped, the eye was turned outward, and the pupil was dilated. At this time no other evidence of paralysis was found. There was no anæsthesia. There were no choked disks. Soon after Cheyne-Stokes respiration began, the patient became comatose, and died April 15th.

Autopsy.—Over the left orbital plate the dura mater was adherent to the brain. In the left frontal lobe was found an abscess of the size of an English walnut, which involved the cortex of the orbital lobule and of the middle frontal convolution. Its anterior, inferior, and external walls were composed of thinned cortex, the remaining walls of white matter. Its diameter was 38 mm., and it was lined by a membrane 1–2 mm. thick. It had destroyed the entire white centre of the frontal lobe to within 10 mm. of the island of Reil and 8 mm. of the nucleus caudatus, but had not involved a portion near the convexity. Broca's centre of speech in the inferior or third frontal convolution escaped. (E. C. Seguin, *Archives of Medicine*, Feb. 1881.)

CASE VII. *Abscess of the Frontal Region.*—Male, æt. 24, entered the Massachusetts General Hospital for the removal of a tumour of three years' growth, from his forehead, which had followed a fall. The tumour was a smooth, ivory exostosis, occupied more than one-half of the forehead on the left side, measuring 5 inches across and being $2\frac{1}{2}$ inches thick. It had displaced the left eye downward and the sight of this eye was impaired. There were no cerebral symptoms at any time, but it was noticed that the patient was querulous, complaining, and timid, and a little slow of speech. The tumour was removed October 17. The patient did well up to November 11, when meningitis set in and caused his death on the 24th.

Autopsy.—Recent meningitis was found. An exostosis had projected internally, compressing the left frontal lobe of the brain. The whole frontal lobe was the seat of an abscess. The inflammation had extended to the right hemisphere at one point, where there was an effusion of pus on its median surface. (R. M. Hodges, *Boston Med. and Surg. Journ.*, vol. lxxi. 413.)

CASE VIII. *Abscess of the Frontal Region.*—Male, was hit with much force directly on the nose, which was flattened by the blow. During the next three weeks he suffered from severe headache and general debility, and was constipated. On April 1st, twenty-one days after the injury, he died very suddenly.

Autopsy.—In the left frontal lobe an abscess was found as large as a hen's egg, filled with pus and broken-down cerebral matter. It communicated with the anterior cornu of the lateral ventricle, and had also opened externally through a sinus situated at the anterior end of the corpus callosum, $\frac{1}{8}$ inch to the left of the longitudinal fissure. The lateral and fourth ventricles were filled with pus, which was also effused over three-quarters of the base of the brain. Death had been due to the rupture of the abscess into the ventricles. (Lidell, *Amer. Journ. of Med. Sci.*, July, 1883; quoted from *Circular No. 3*, Surg.-Gen. Office, U. S. A., 1871.)

CASE IX. *Abscess of the Frontal Region.*—Male, æt. 31, suffered from chronic otitis media, resulting in the formation of a mastoid abscess, which opened into the lateral sinus and produced pyæmia, with multiple infarctions in the lungs and abdominal viscera. "The patient was carefully watched for indications of cerebral disease because intracranial abscess was suspected; but there was no paralysis of motion or sensation, no aphasia, and no delirium until exhaustion set in. Patient suffered from severe pain in the right side of the head and in the ear."

Autopsy.—An abscess was found "in the left frontal lobe just at the border of the white substance," 1 cm. in diameter. "The debris in the centre of the infarctus was composed of leucocytes and cholesterine crystals. The tissue for some distance around the infarctus was pale and devoid of blood, the vessels not containing a single blood corpuscle." An inflamed artery was found about an inch below the infarctus. Numerous cholesterine crystals were found in the substance of the brain. (D. W. Prentiss, *Amer. Journ. of Med. Sci.*, April, 1882.)

CASE X. *Abscess of the Frontal Region.*—Male, æt. 18, fell on February 9th, and struck the right side of the head. Patient was unconscious for ten minutes, but then recovered. On the 11th, he was free from pain and rational. On the

17th, pain at the base of the skull began, with some stiffness of the limbs. On the 22d, he had become drowsy and apathetic, but did not suffer. On March 6th, ptosis of right eyelid with dilatation of the pupil developed, the patient began to vomit, and it was noticed that he was sulky and morose instead of cheerful as formerly. On the 17th, he became suddenly insensible; resp., 37; pulse, 137; face and hands congested and cold. The urine was then found to contain albumen and casts. He recovered consciousness after a few hours. After this attack the patient suffered much from headache, drowsiness, and pain in the left side of his face and in the left hand. At times the right eyelid was swollen, the eyeball protruded, and the pupil was dilated. He became stupid and disinclined to talk. Toward the close of life his head was constantly turned to the right, and attempts to turn it to the left caused pain. On April 26th he died.

Autopsy.—Dura was adherent to the brain over the right orbital bone, which was fractured. The right frontal lobe was fluctuating and its convolutions flattened. Incision into it showed the presence of an abscess containing 100 cc. of green pus in a well-defined capsule, which extended to but did not perforate the lateral ventricle, and did not involve the great ganglia. The brain below it was very thin, but above it there was a thick layer of normal substance. (Edes, *Boston Med. and Surg. Journ.*, vol. cii. p. 447.)

CASE XI. *Abscess of the Frontal Region.*—Male, æt. 9, was struck on the head near the right frontal protuberance, and stunned by the blow, but did not lose consciousness. He vomited some afterwards, and for several days had a large ecchymosis on the forehead. When this subsided he appeared as well as usual. He continued to be perfectly well for four months, the only unusual occurrence being an occasional intense congestion of the face. At the end of this time he had an attack of acute rheumatism, during which he went into a state of coma and died in one week.

Autopsy.—The meninges were thickened over the right frontal lobe. In the right frontal lobe a cavity was found as large as a pigeon's egg, occupying the white substance between the anterior superior part of the corpus striatum and the cortex, and approaching the surface of the brain anteriorly. The walls of the cavity showed traces of chronic inflammation. The cavity was filled with a dark clot. It was considered the cavity of an old abscess, into which the rupture of vessels in its walls had caused the fatal hemorrhage. (F. G. Smith, *Proceedings of Phila. Path. Soc.*, March 24, 1870, vol. iii. p. 165.)

CASE XII. *Abscess of the Frontal Region.*—Male, æt. 35, was struck on the forehead and stunned, and for the next few weeks suffered from all the symptoms of acute encephalitis. From this he recovered completely and went to his business for six months; the only changes noticed in him being that he was much more talkative than before the injury, and that his pulse was now slow, rarely exceeding 50. After six months he was taken ill and died in a few days.

Autopsy.—The right frontal lobe contained an encysted abscess which extended from the extremity of the lobe to the fissure of Sylvius. A very thin lamina of softened gray matter surrounded the cyst. The dura was adherent to the right frontal lobe. (Bartholow, *Journ. Psycholog. Med.*, vol. ii. p. 360.)

In these cases destruction of the frontal lobe of greater or less extent occurred from softening or abscess. In none of these cases were paralysis, aphasia, loss of sensation, or sensory disturbance present as a consequence of the local lesion. In two cases an indirect local symptom, viz., paralysis of the third nerve, occurred from pressure upon the nerve in its course. In four cases mental symptoms, consisting of an undue excitability and a lack of self-restraint, were noticed.

Hemorrhage into the frontal lobe is a rare lesion, and no cases were found on record. Cases of tumour of the frontal lobe are numerous.

CASE XIII. *Glioma in the Frontal Lobe.*—Female presented no symptoms of brain disease during a long stay in the almshouse, but died very suddenly.

Autopsy.—A glioma of the size of a small orange was found in the white matter of the frontal lobe anterior to the anterior central convolution.¹ (Janeway, *Trans. N. Y. Acad. of Med.*, vol. iii. p. 187.)

CASE XIV. *Sarcoma in the Olfactory Groove.*—Female, æt. 50; suffered for several months before her death from epileptic attacks preceded by an aura consisting of a feeling as if the patient were walking backward. Constant severe headache, and persistent vomiting were prominent symptoms. There was no paralysis nor disturbance of vision; optic disks were normal. Patient died in a convulsion.

Autopsy.—A sarcomatous tumour, 4 cm. by 3 cm. in diameter, was found in one olfactory groove, which had destroyed the olfactory nerve, had involved the pia, and had softened the brain around.² The cerebellum was congested and softened. (H. C. Wood, *Phila. Med. Times*, vol. iv. p. 471.)

CASE XV. *Sarcoma in the Frontal Lobe.*—Female, æt. 45. Several years before the outset of the symptoms she had a fall and injured the right frontal bone. In 1871 she had a sudden attack of vertigo, with momentary blindness; and after recovering from this a gradually progressing failure of sight developed. In February, 1872, choked disks were found in both eyes. The only other evidence of cerebral disturbance was an occasional attack of vertigo. She became blind in 1874; and died suddenly, January 17, 1876.

Autopsy.—A sarcoma of the size of an English walnut was found in the frontal lobe of the right hemisphere attached to the dura, just above the orbital plate. A sharp-pointed osseous growth extended upward from the orbital plate, and to this the dura and the tumour were adherent. (A. Mathewson, *Trans. N. Y. State Med. Soc.* 1878, p. 170.)

CASE XVI. *Sarcoma in the Frontal Lobe.*—Male, æt. 27; suffered from severe headache for a year, and then noticed a failure of vision, especially in his right eye. This increased very rapidly, so that in fourteen days vision was reduced to mere perception of light in the right eye, and in a month the eye was totally blind. The left eye was then affected, and in thirty-two days vision was reduced from $\frac{1}{2}$ to $\frac{1}{4}$. In three months this eye was also totally blind. Hearing then became affected, and by the end of the sixth month from the first observation the patient was totally deaf. The sense of smell was also lost during this period. The other cranial nerves were not affected. Toward the close of life taste was lost, and his speech became incoherent; he lost flesh, and at the end of nine months, *i. e.*, twenty-one months after the headache began, he died of exhaustion.

Autopsy.—In the right frontal lobe of the brain a tumour was found involving its inferior portion, and adherent to the dura mater over the cribriform plate; it was about 5 cm. in diameter. Microscopic examination showed it to be a fibrosarcoma. There was much hyperæmia of the base of the brain as far back as the anterior part of the pons; other parts of the brain normal. (L. Howe, *Buffalo Med. and Surg. Journ.*, Feb. 1882.)

CASE XVII. *Sarcoma in the Frontal Lobe.*—Female, æt. 50; suffered from headache, vertigo, and attacks of falling, without convulsions (*petit mal*). She gradually lost the sight in both eyes, and ophthalmoscopic examination showed the presence of choked disks. She had no paralysis or aphasia.

Autopsy.—A sarcoma was found on the surface of the right frontal lobe, which pressed upon the inferior and middle frontal convolutions at about their middle part. (J. C. Shaw, *Trans. Amer. Neurol. Assoc.* 1877. Report in *Journ. Ment. and Nerv. Dis.*, July, 1877.)

CASE XVIII. *Fibroma in the Frontal lobe.*—Male, æt. 35, syphilitic, had a fall in June 1877, and hit his head. In August, after a spree, suffered from headache and vomiting. His health gradually declined, and for nine months prior to September, 1878, he was in the Pennsylvania Hospital. While there he had headache, which was worse at night; apparent loss of power in his limbs, especially of the right side; gradual failure of vision, first in right and then in left

¹ The side on which the tumour lay is not stated.

² The side on which the tumour lay is not stated.

eye, until he was totally blind; mental hebetude and uncertainty with a tendency to hallucinations; spasmodic contraction in the muscles of the neck, forearm, and eyes; nystagmus; and involuntary discharges. There was no vomiting, no fever, no vertigo, no convulsions, no aphasia, no paralysis of the cranial nerves. In September, 1878, he was transferred to the Philadelphia Hospital. He usually lay on his back with his head retracted. There was no muscular atrophy. His appetite was good; he was constipated; he did not notice his involuntary discharges. There was no cranial nerve paralysis excepting loss of smell and of vision. Ophthalmoscopic examination showed choked disks and retinal hemorrhages. Movements of his hands and arms were possible, but wanting in strength and accuracy; he fumbled with his hands constantly. His legs were usually extended and motionless, but sometimes they were found drawn up and rigid, when they could be straightened with difficulty. Passive motions were resisted. Sensation did not appear to be affected, though he was too stupid to be tested accurately. His intellect was much impaired. Formerly he had been intelligent and energetic, now he was slow, and seemed to have difficulty in receiving mental impressions and in directing voluntary movements. The faculty of attention was almost gone, and his attention was only to be fixed by vehement command. He could hear, but it was necessary to speak very loud in order to call out a mental response. He appeared to be in a dazed condition. He was not aphasic, and spoke clearly in a firm voice without omitting words in a sentence. But in answering he seemed unable to retain the same idea, or follow a line of thought. He would not wander, but would stop speaking. He was very emotional. He would at times have outbursts of speech, saying a few sentences very loud and then stop suddenly. Exclamations of this kind would be repeated every few minutes for several hours. They consisted in oaths, demands for food, or references to past events. No further symptoms were noticed: he grew weaker, and on October 16 died. The temp. record showed an evening rise to 99° or 101° . The surface temp. of his head was 1° to $1\frac{1}{2}^{\circ}$ F. higher over the right frontal region than elsewhere. This was frequently verified.

Autopsy (6 hours p. m.).—No meningitis. Vessels of brain congested. Looking at the brain from above, a large bloody looking tumour was seen lying obliquely across the right frontal lobe, and involving the anterior upper half of the superior frontal, and the anterior upper and inner half of the middle frontal convolutions. It had also destroyed a small segment of the gyrus fornicatus where it bends around the ant. genu of the corpus callosum; and finally it had invaded the anterior portion of the corpus callosum for a distance of $\frac{1}{2}$ inch; the diseased mass barely touching the gyrus fornicatus of the opposite side. It was overlapped by the outer and posterior parts of the frontal convolutions, and did not encroach upon the inferior frontal or anterior central convolution. It did not project above the level of the brain. The hemispheres were thrust apart in front. The membranes over the tumour were destroyed. The basal convolutions were normal. It was irregular, nodular, and pyriform in shape, its apex being in the corpus callosum and base in the convexity. It was firm and hard, its cut surface being a mottled-red colour. Dimensions were $3\frac{1}{2} \times 3 \times 2\frac{1}{2}$ inches; weight 7 oz. The lateral ventricles contained a few drops of blood, and the choroid plexus was engorged. The corpora striata and optic thalami were congested, especially on the right side, and the corpora quadrigemina were also red. The brain as a whole was firm and consistent, and in all other parts normal. The cerebellum was small in ratio to the cerebrum.

Microscopic examination showed it to be a fibroma. Examination also showed the optic papillæ swollen, and the subvaginal spaces dilated. There were a few sclerotic spots in the medulla and pons. (C. K. Mills, *Phila. Med Times*, vol. ix. p. 184.)

The symptom of compulsory speech present in this case is very rare. The mental symptoms are carefully recorded, and are typical of this class of cases.

CASE XIX. *Gumma in the Frontal Lobe.*—Female, æt. 32, syphilitic, suffered for nine months prior to her death from constant headache, epileptic convulsions

increasing in frequency, dimness of vision in both eyes due to choked disks, and exophthalmos. No other symptoms. After a convulsion she became comatose and died.

Autopsy.—At the anterior portion of the left frontal lobe, a large gummy tumour growing in the dura was found which had extended into the brain substance adjacent. The brain substance near it was softened. The left lateral ventricle was distended by serum, and its floor was softened. The veins of the left hemisphere were distended. The meninges were normal and not adherent, excepting at the situation of the tumour.

Microscopic examination showed the anterior and middle lobe of the left hemisphere to be “in a condition of simple decay produced by maceration.” This was most advanced in the vicinity of the tumour.¹ (H. Knapp, *Arch. of Ophthal.*, vol. iv. p. 245.)

CASE XX. *Gummata of the Frontal and Parietal Lobes.*—Male, æt. 36, syphilitic, suffered from severe continuous headache with sensitiveness to pressure over the frontal and parietal regions of the cranium. His faculty of attention was wanting, and continuous thought was impossible. He was very emotional and cried often. There was general hyperæsthesia. His sight was impaired and pupils contracted. Toward the close of life there was fever with delirium, and patient died comatose. (Duration of symptoms not stated.)

Autopsy.—A gumma $1\frac{1}{4}$ inches in diameter was situated over and had involved the superior anterior part of the superior and middle frontal convolutions on the right side. Here the pia and dura were adherent to the tumour, and there was a pachymeningitis surrounding it. A second gumma $\frac{3}{8}$ inch in diameter was found adherent to the pia, in the right supra-marginal convolution, at the extreme posterior point of the horizontal branch of the fissure of Sylvius. A third gumma $\frac{3}{8}$ inch in diameter adherent to the pia and dura, was situated in the retro-central fissure, $\frac{1}{2}$ inch behind the junction of the upper and middle thirds of the fissure of Rolando. (C. K. Mills, *Archives of Medicine*, Aug. 1882.)

The hyperæsthesia—a symptom not present in any other case of frontal lesion—must be referred to the irritation of the parietal cortex, and will be considered again when lesions of this part are studied.

CASE XXI. *Tumours of the Frontal Lobes.*—Male, æt. 30, had suffered for more than a year from constant vomiting without nausea, and gradually increasing dimness of vision. Admitted to hospital March, 1872. In May he had become totally blind, his pupils being dilated, and not reacting to light. His face was very sad, he never smiled, and never conversed except to answer inquiries. The expression was neither one of pain nor of idiocy, but was very pathetic. If questioned he answered correctly in a clear low tone and very distinctly. His memory of past events was good, but of recent occurrences was poor. “His intellection was retarded, but not absent nor irrational.” His hearing was perfect. There was no paralysis, aphasia, dysphagia, or staggering, nor was there any diminution of sensibility or hyperæsthesia. On May 29, he was very restless, walking constantly about the ward, and obeying the calls of nature in any place without hesitation or question, though his sphincters were under control. In the evening he had a convulsion and died.

Autopsy.—All the ventricles were distended with serum. There was a hard nodulated mass of the size of a walnut in the white substance of the left frontal lobe surrounded by gelatiniform substance and non-fluent pus. In the same location precisely in the right frontal lobe was a similar mass the size of a hickory-nut surrounded by colloid matter and softened white brain matter not quite purulent. There was no odour to the brain. There was an occlusion of the basilar artery $\frac{1}{4}$ inch in length at the middle of the pons. The central lobes were bloodless both on their surface and interiorly. Puncta vasculosa were more numerous in the left middle lobe than in the right. The hard masses were situated just exterior to the olfactory bulbs, and must have compressed these organs, but being anterior to the fissure of Sylvius could not have pressed on the optic

¹ Probably a post-mortem condition is intended.

nerves or chiasm. The anterior cornua of the lateral ventricles were pressed upon but not ruptured. (D. Wooster, *Pacific Med. and Surg. Journ.*, Aug. 1872.)

CASE XXII. *Tumour of the Base involving the Frontal Lobe.*—Female, æt. 20, suffered from constant vomiting for several months without known cause. Then she became unable to hold anything in her hands and unable to walk well, and three days after her sight and her speech were impaired. She was then admitted to the hospital March 27. Previous history was doubted. Present condition is as follows: In the right eye light is not perceived, and in the left eye vision is much impaired; Snellen's type $6\frac{1}{2}$ is seen at 6 inches; ophthalmoscopic examination shows neuro-retinitis of both eyes, most marked in the right eye; pupils natural; smell is impaired. The right half of the face is anæsthetic, and feels numb and swollen. She has much headache especially in the frontal region, and on the right side. There is no paralysis of the face. The tongue is protruded with difficulty, and deviates to the right side. Taste and hearing are perfect. Pulse is 46 and irregular; resp. 15; extremities are cold. There is no loss of motor power, and she can walk with tolerable certainty if led. There is no loss of sensation except in the face. No aphasia. The patient improved slightly during the first week, the pulse becoming regular and faster. Headache and vomiting became more severe during the next month, and with no further development of symptoms the patient sank into a state of coma, and died May 5.

Autopsy (12 hours post-mortem).—A tumour was found on the base of the brain lying under and compressing the left frontal lobe. It filled the anterior fossa extending from the falx cerebri to which it was adherent, over the sella turcica to the right petrous bone. The anterior part of the tumour was hard, the posterior soft. The posterior part had extended across to the right side 1 inch, producing a corresponding cavity in the brain. It was 3 inches long, and had compressed the left olfactory nerve, the right V., and the Gasserian ganglion, the optic chiasm, and the cavernous sinus. No microscopic examination. (Williams, *Med. Record*, vol. iii. p. 30.)

The only symptom which might be considered a local symptom of cortical lesion in this case, is the paralysis of the right xii. nerve. Considering the situation of the tumour on the base and its extent, it is impossible to determine whether this was due to indirect pressure on the medulla or to direct upward pressure upon the motor area for the tongue. This case illustrates the absolute importance of accurately describing the convolutions which are involved in any lesion.

CASE XXIII. *Tumour of the Base involving the Frontal Bone.*—Male, æt. 20, after taking cold from exposure was attacked with paresis of the left vi. n. producing diplopia. This disappeared in three weeks. Six months later a second attack of diplopia occurred, which was found to be due to paralysis of the r. iii. n. and which became permanent. It was soon followed by attacks of severe headache occurring daily for some hours. No other symptoms were noticed until nearly three years later, when slight paresis of the left leg developed, and a disturbance of vision which was found to be due to a beginning optic neuritis in the left eye. Nine months after this the patient had a sudden attack of the left hemiplegia without loss of sensation. At this time there was total right iii. n. paralysis, nystagmus in left eye, dilated pupils, and double choked disk. During the following months his condition became worse. Partial anæsthesia of the paralyzed side developed—patient had difficulty in swallowing and in speaking, a few words only being spoken, and he became blind in both eyes. He was confined to his bed, though able to stand and walk with assistance, and the headache and insomnia caused much suffering. Eight months after the hemiplegic attack he died.

Autopsy.—The dura was thickened and adherent on the left side near the longitudinal sinus. The pia was congested. A tumour 6 cm. thick and 15 cm. in circumference extended upon the base of the brain from the anterior clinoid process to within 2 cm. of the foramen magnum, and encroached on the apices of

the petrous bones. It was under the dura, but had pressed up the parts above it. It had two lobes, the right being larger. It was hard and dense. It had compressed the optic nerves, the chiasm and tracts, and the crus, and also the olfactory nerves. These parts were thin and atrophied. A second tumour the size of a walnut was found embedded in the anterior inferior surface of the left hemisphere and surrounded by a large clot of blood. (J. A. Spalding, *Arch. of Ophthalm.*, vol. ix. p. 160.)

The paralysis was due to pressure upon the right crus cerebri, as was indicated during life by the combination of left hemiplegia with right iii. n. paralysis. None of the local symptoms can, therefore, be connected with the tumour in the frontal lobe.

In these cases tumours, situated in various parts of the frontal lobe and involving both its cortex and its substance, were present for a considerable time, but did not give rise to paralysis, aphasia, disturbance of sensation, or of the senses, except sight. In all cases they produced an increase of the intra-cranial pressure and the general symptoms consequent upon it. The most noticeable of these symptoms was the choked disk and the accompanying gradual development of disturbance of vision. The loss of sight is to be ascribed to this cause, and not to any destruction of the visual area, because in its progress and character it differs from the blindness produced by lesions of the visual area; and because destruction of identical portions of the frontal lobe by lesions not increasing the intra-cranial pressure failed to produce blindness. The visual area cannot, therefore, be located in the frontal lobes. In two of these cases epilepsy was the prominent symptom. This may be produced by any lesion in any location, as will be shown in considering lesions of other areas. In two cases an indirect local symptom was present, viz., loss of smell, due to pressure of the tumour upon the olfactory nerve.

In reviewing the cases here cited of lesion of the frontal region, it is noticeable that decided mental disturbance occurred in one half. This did not conform to any one type of insanity. It is rather to be described as a loss of self-control, and a consequent change of character. The mind exercises a constant inhibitory influence upon all action, physical or mental; from the simple restraint upon the lower reflexes, such as the action of the sphincters, to the higher control over the complex reflexes, such as emotional impulses and their manifestation in speech and expression. This action of control implies a recognition of the import of an act in connection with other acts; in a word, it involves judgment and reason, the highest mental qualities. By exhibiting all but one set of impulses it enables one to fix attention upon a subject, and hold it there. It is the possession of these qualities which chiefly distinguishes a normal man from an idiot, or from the lower animals. Memory and the association of memories, may be well developed in many animals. Memories are as various in kind as the senses through which the original perceptions which are remembered were acquired. A loss of these various kinds of memory is found chiefly in those forms of disease which affect the

areas of the brain, whose function is that of sensory perception. Cases are on record, and will be cited, in which one class of memories, *e. g.*, memories of objects seen, letters, faces; or memories of things heard, language, music; or memories of motions acquired by practice, writing; have been lost, while all other kinds of memory remained, and mental action was good. These facts demonstrate the location of memories in the various sensory areas of the cortex. Memory does not appear to be affected in disease of the frontal lobes. In respect of judgment and reason the power of man surpasses that of the lower animals. The brain of man differs from that of the lower animals and of idiots chiefly in the greater development of the frontal lobes. It seems probable, therefore, that the processes involved in judgment and reason have as their physical basis the frontal lobes. If so, the total destruction of these lobes would reduce man to the grade of an idiot. Their partial destruction would be manifested by errors of judgment and reason of a striking character. One of the first manifestations would be a lack of that self-control which is the constant accompaniment of mental action, and which would be shown by an inability to fix the attention, to follow a continuous train of thought, or to conduct intellectual processes. It is this very symptom which was present in one-half of the cases here cited. It occurred in all forms of lesion; from injury by foreign bodies, from destruction by abscess, from compression and softening due to the presence of tumours; and, therefore, cannot be ascribed to any one form of disease. It did not occur in lesions of other parts of the brain here cited. Many other cases must be carefully studied before any conclusion regarding this symptom can be reached. But its presence in such a large number of these cases warrants the suggestion that in cases of suspected lesion of the frontal lobe, the mental condition of the patient as shown by his acts of judgment and reason should be carefully examined, and a change of character or behaviour accurately noted.

Aside from the disturbance of mental action the symptoms of lesion of the frontal lobes are chiefly negative. The absence of disturbances of motion and sensation and of the special senses warrants the statement that the motor and sensory areas of the cortex do not lie in the frontal region. These conclusions agree in all respects with those of foreign observers.

No cases of pure motor aphasia associated with a lesion limited to the posterior part of the left inferior or third frontal convolution, such as are cited by Nothnagel and Charcot, are found in the American records. The cases of aphasia recorded were associated with paralysis, and the lesion was extensive, involving portions of the central region. In all the cases of aphasia, which conform to the conditions here adopted, a lesion of the left Sylvian region was present, and in the majority of them the third frontal convolution was involved.¹ There is therefore no case in the

¹ Fifty cases of aphasia were collected by Seguin in the Journ. of Psych. Med. 1868. Of these, nine are accompanied by a record of autopsy. Of these nine, none complies

American record which opposes the statement of the foreign observers that lesion of the left third frontal convolution produces ataxic aphasia without paralysis. But inasmuch as the third frontal convolution was not affected *alone* in any case, no statement of its function is warranted.

The diagnosis of lesions of the frontal convolutions must rest upon the presence of general symptoms of cerebral disease and of mental disturbance, and also upon the absence of motor and sensory disturbance.

II. TEMPORAL LOBES.

Lesions affecting the temporo-sphenoidal lobes will be next considered. They may be divided into two classes: first, those affecting the convolutions upon the base of the brain, the temporo-sphenoidal convolutions; and secondly, those affecting the convolutions lying below the Sylvian fissure on the convexity, the first and second temporal convolutions.

CASE XXIV. Softening of the Temporo-sphenoidal Lobes.—Female, æt. 40, suffered from the age of 10 from epileptic attacks, which occurred four or five times a year, and consisted of general convulsions. The first attack occurred after a fall when she struck her head, and was unconscious thereafter for some hours. No scar was visible on the head. She always had an aura of a peculiar character before the attack. She suddenly perceived a disagreeable odour, sometimes of smoke, sometimes of a fetid character, and quite uncomplicated by other sensory warnings. She was under observation two years, and finally died of phthisis.

Autopsy.—The dura mater was thickened and opaque in spots, and on the base was adherent to the temporo-sphenoidal lobes. There was an excess of fluid in the ventricles, and the brain was small. The adhesion of the membranes was most marked on the right temporo-sphenoidal lobe somewhat posterior to its apex. At this point a decided shrinkage of tissue was discovered with depression, the induration involving the uncinate gyrus and parts of the adjacent convolutions. The basal ganglia and motor tracts were normal, and the olfactory nerves were not involved. (A. McLane Hamilton, *N. Y. Medical Journal and Obstetrical Review*, June, 1882.)

This case is of much interest, as the perception of sensations of smell has been localized by Ferrier in animals in the region here involved. While sensory aura are not rare, it is only in a few cases that an autopsy has indicated the localization of the sense irritated, by demonstrating the area of the brain involved. Hamilton has collected a number of such cases in the article from which this case is quoted. They are either foreign cases, or American cases in which more than one lesion was found, and therefore cannot be admitted to this collection. A conclusion that the area for the sense of smell lies in the inner part of the base of the temporo-sphenoidal lobe is hardly warranted from the small number of cases recorded. But when considered in connection with the physiological conclusions it may be recorded as a possible symptom of disease in this region. Its

with Nothnagel's conditions; five of the cases dying within eighteen days, and the other four presenting extensive lesions not limited to the cortex. They are therefore not available for purposes of cortical localization, though in all the left Sylvian region was involved.

absence in other cases of such disease cannot be affirmed, as few observers have been sufficiently careful in the examination of cases to test this sense.

CASE XXV. *Abscess of the Temporo-sphenoidal Lobe*.—Male, æt. 25, had a chronic otitis media which led to the development of cerebral symptoms; headache, vomiting, fever, constipation, and slow pulse. There was no impairment of sensation or motion during his illness, which lasted fourteen weeks.

Autopsy.—An abscess was found situated above the petrous portion of the temporal bone on the right side. The brain about the abscess in all directions was in a condition of white softening, which extended nearly to the posterior part of the hemisphere. (E. H. Clarke, *Arch. of Scien. and Prac. Med.*, vol. i. p. 50.)

CASE XXVI. *Abscess of the Temporo-sphenoidal Lobe*.—Male, æt. 23, had chronic otorrhœa when a child. One year before his death was stabbed behind the right ear. The mastoid bone became necrosed, and for a year there was a discharge of pus from the mastoid cells. Dead bone was removed and pus evacuated two weeks before his death. There were no brain symptoms, pain at the point of injury being his only complaint. A few days after the operation he suddenly died.

Autopsy.—The anterior surface of the right petrous bone was necrosed, and the dura above it inflamed. In the right middle lobe of the cerebrum corresponding to the inflamed dura was an abscess containing pus, its cavity being lined with membrane. The third ventricle contained pus. (E. Krackowizer, *Trans. N. Y. Path. Soc.*, vol. i. p. 10.)

CASE XXVII. *Abscess of the Temporo-sphenoidal Lobe*.—Male, æt. 19, had suffered from chronic otorrhœa from the left ear for several years, which had been associated with considerable deafness. The discharge suddenly ceased, patient began to suffer from headache, nausea, and vomiting; quick pulse, and fever. These symptoms continued for ten days, during which time there was no disturbance of intellect, of vision, taste, or smell, and no paralysis. On attempting to get out of bed he suddenly became comatose and died.

Autopsy.—Caries of the petrous portion of the left temporal bone was found, and above it an abscess in the temporal lobe of the cerebrum near the base, containing $2\frac{1}{2}$ ounces of pus, which had involved a large portion of the temporal lobe and had burst into the left lateral ventricle. (A. Nebinger, *Med. Record*, vol. i. p. 61.)

CASE XXVIII. *Abscess of the Temporo-sphenoidal Lobe*.—Male, æt. 35, suffered from violent facial neuralgia of the left side with protrusion of the left eyeball and ptosis of the left upper lid for six months before his death. None of his special senses were impaired, and he had no paralysis. He died comatose.

Autopsy.—Caries of the left great wing of the sphenoidal bone, with adhesion of the dura to the brain above this point was found. An abscess had formed in the left temporo-sphenoidal lobe in its inferior convolution, and had burst into the lateral ventricle. (Harlan, *Med. Record*, vol. xix. p. 304.)

Of the many cases on record in the journals of otology, these are the only ones in which the abscess was not accompanied by an extensive general meningitis. They are chiefly of a negative value, as are also the following cases of tumour of the temporo-sphenoidal region.

CASE XXIX. *Sarcoma of the Temporo-sphenoidal Lobe*.—Female was brought into Bellevue Hospital in a condition of alcoholism, with a scalp wound. She was stupid, answered questions in monosyllables, and had no apparent paralysis. She died in four days.

Autopsy.—A tumour of the size of an egg was found in the left middle fossa of the skull, pressing upon the apex of the temporo-sphenoidal lobe and on the left optic nerve. It was a spindle-celled sarcoma. (E. G. Janeway, *Trans. N. Y. Acad. of Med.*, iii. p. 187.)

CASE XXX. *Sarcoma of the Temporo-sphenoidal Lobe*.—Male, æt. 29. Patient suffered for three years and a half from headache, vertigo, and attacks of falling, without loss of consciousness or convulsions. He had no paralysis.

Blindness gradually developed as a result of choked disks. Condition of sensation and of the other senses is not mentioned.

Autopsy.—A cystic tumour (a sarcoma) was found in the left temporal fossa, compressing the anterior and inferior surface of the left temporo-sphenoidal lobe of the brain. (J. C. Shaw, *Trans. Amer. Neuro. Assoc.*, 1877. Report in *Journ. Ment. and Nerv. Dis.*, July, 1877.)

CASE XXXI. *Sarcoma of the Temporo-sphenoidal Lobe.*—Female, æt. 39, began to have attacks of grand mal and of petit mal seven weeks before her death, and within two weeks of their commencement her mind became affected, she became drowsy and stupid, and went into a condition of dementia, so that on admission to the N. Y. Hospital she lay in a state of semi-consciousness all the time. She could be aroused, and understood enough to protrude her tongue when told to do so, but gave no other sign of consciousness. She once attempted to get out of bed. No ocular symptoms, no facial or other spasms, and no paralysis were noticed. Percussion on the left side of her head was painful. She died ten days after admission from exhaustion.

Autopsy.—The convolutions of the left hemisphere were flattened. A tumour was found at the base of the temporo-sphenoidal lobe on the left side, its under surface flattened and resting partly upon the left lobe of the cerebellum. The pia mater was normal. The tumour occupied the posterior part of the fourth and fifth temporal convolutions, and the third convolution was atrophied. The antero-posterior diameter was 2 inches; its transverse diameter was $1\frac{1}{2}$ inch; its vertical diameter was $1\frac{1}{4}$ inch. A layer of normal brain tissue, $\frac{1}{8}$ inch thick, separated it from the lateral ventricle, whose ependyma was normal. The tumour was a sarcoma. (*N. Y. Hospital Histories*, N. S., vol. x. p. 445. Dr. W. H. Draper.)

CASE XXXII. *Gumma of the Temporal Convolutions.*—Male, æt. 33; syphilitic. After a blow on the head, he suffered from continuous dull headache, which was occasionally severe; from vomiting and constipation; from impairment of sight, and of hearing in the right ear; from partial anæsthesia of the right side, and from hyperæsthesia of the left side. He was stupid and drowsy, and seemed to lack energy. General convulsions occurred a few hours before death.

Autopsy.—A gumma $1\frac{1}{4}$ inch in diameter, adherent to the dura and pia, was found involving the first and second temporal convolutions of the left hemisphere. A layer of brain substance, both anterior and posterior to the tumour, was softened. An abscess was found on the inner side of the tumour which had destroyed much of the white matter of the temporal lobe. (C. K. Mills, *Arch. of Med.*, August, 1882.)

CASE XXXIII. *Foreign Body in the Temporal Lobe.*—Male, æt. 20, had a cylindrical piece of iron, 1 inch long and $\frac{3}{4}$ inch in diameter, driven into the left side of his head by the explosion of a gun. He was stunned, but soon recovered, and complained only of headache, defect of hearing in his left ear, and soreness in the wound. An attempt to remove the foreign body failed. The patient went back to his work, and for four and a half months presented no brain symptoms whatever, except the deafness. The fistula remained and discharged pus. At the end of this time he went on a spree, and the next day was seized with violent headache, and died in three hours.

Autopsy.—“The iron was found in the anterior and inferior angle of the left middle lobe of the cerebrum, in near proximity to the fissure of Sylvius. The cavity in which it was embedded was lined by a membranous cyst.” (Geo. Burr, *Amer. Journ. Med. Sci.*, July, 1882, p. 59.)

It is difficult to determine in the last two cases whether the symptom of deafness is to be associated with disease of the temporal convolutions, or is to be ascribed to a direct lesion of the auditory nerve. The latter is probable in the second case, both from the direction of the wound and from the fact that the deafness was on the side of the lesion. In the few foreign cases in which deafness accompanied a lesion of the temporal

lobe, as in Case XXXII., the ear opposite to the lesion was the one affected. This accords with the results of physiological experiment, which locate the perception of auditory sensations in the first temporal convolution of the opposite side. In a case to be cited later (Case L.) the first temporal convolutions on both sides were atrophied, and the patient was totally deaf. It is well known that sensory aphasia has been associated with lesions of the first temporal convolution. The loss of the memory of sounds, and the consequent failure to recognize words when spoken, as well as the inability to speak, which is due to the impossibility of remembering how the words sound which one desires to use, is a form of aphasia which is characteristic of disease in this region of the brain. The American records contain several well studied cases of this kind, in all of which the first temporal convolution was involved. Unfortunately, however, in none of the cases was this convolution involved *alone*. In six cases the central region was also affected, and paralysis was associated with the aphasia. These will be considered later. In the following case the supramarginal convolution was affected as well as the temporal; but as the prominent and permanent symptom was the aphasia this case is cited here. The report of the case is as thorough and accurate as any in medical literature, and suffers much in the attempt at condensation. Only its chief features, however, can be mentioned.

CASE XXXIV. *Amnesic Aphasia*—Male, æt. 52, was suddenly seized with aphasia and incomplete right hemiplegia with anæsthesia, and pain in the left frontal region, there being no loss of consciousness at the time. After six weeks the paralysis had almost entirely disappeared, but the aphasia remained. It was amnesic aphasia, or word deafness, many words being unrecognized, and these being the ones he could not pronounce. The concepts could be recalled, but their symbols in words were gone. He could read aloud, but would often substitute other words for those seen, being at the time aware of the fact. Gesture language was understood and used. There was at first agraphia, but he learned to write. Hearing and sight were unimpaired, and memory, except for words and sounds, was good. Spacial relations were understood, but he had a tendency to hold objects, *e. g.*, cane, pen, knife, etc., by the wrong end, and would correct himself, angrily. Paræsthesia, without anæsthesia, occurred constantly in the regions supplied by the ulnar nerve, and by the musculo-cutaneous nerve of the leg on the right side. One year after the first attack a second one occurred, accompanied by hallucinations of sound on his right side, and slight paresis and anæsthesia of the left side, all of which symptoms soon disappeared entirely. Two months after this a final attack occurred, with vertigo, rotatory movements to the right, mental confusion, sudden blindness, which passed away in two hours, gradual failure, and in six weeks death. The aphasia was the chief and permanent symptom.

Autopsy.—The left hemisphere was the seat of a large depression, caused by the destruction of several convolutions, viz., the whole of the inferior parietal lobule, with the first two temporal gyri. The posterior central convolution was preserved intact, as was also the posterior extremity of the angular gyrus. The lesion was a yellow patch of softening lying in the region supplied by the posterior terminal branches of the left middle cerebral artery. The softening destroyed the cortex and the white substance beneath it, as far down as the roof of the lateral ventricle. (A. B. Ball, *Arch. of Med.*, April, 1881.)

From the review of these cases the following facts appear: Lesions of the temporo-sphenoidal lobes may exist without giving rise to any local

symptoms. Symptoms of disturbance of the special senses of hearing and smell, and loss of memory of perceptions acquired through these senses, may be caused by lesions of this region; odours being probably perceived in the inner sphenoidal convolutions, and sounds in the first temporal convolutions. The areas connected with motion, with general sensation, and with vision, do not lie in the temporal lobes.

The importance of a careful examination of all the special senses in any case of suspected brain-disease is enforced by the probability that some of the sensory areas lie in this region; but that the symptoms produced by their destruction have been hitherto overlooked. The conclusions here stated are in full accord with those of foreign observers.

III. OCCIPITAL LOBES.

Lesions of this region of the brain are not frequent, and but eleven cases have been found in which the basal ganglia were not involved with the cortical substance.

CASE XXXV. *Bullet in the Occipital Region.*—A girl, æt. 7 years, who had been shot in the head, walked into the office without any brain symptoms. A probe passed in four inches, but did not strike the ball. She died six months afterward from scarlet fever, never having presented any cerebral symptoms.

Autopsy.—The ball had entered the posterior lobe of the right hemisphere near its junction with the middle lobe, passed through it, across the longitudinal fissure, and had entered the left posterior lobe, where it was found embedded in the substance of the brain, near the surface. (J. C. Hutchinson, *Buffalo Med. and Surg. Journal*, vol. v. p. 223.)

CASE XXXVI. *Softening of the Occipital Lobes.*—Male. When five years old was an intelligent child. At that time he began to see dimly, and at last became entirely blind. He then began to show an inability to fix his attention, and at length, within six years, became completely idiotic. One year before his death, which occurred at the age of thirteen, he was attacked with epileptic convulsions, which became more frequent until they destroyed his life. Paralysis of the left side and violent convulsions of the right side preceded his dissolution. During his idiocy he retained the power of singing, could learn new songs, and sang several songs well a few days before death, though he evidently attached no meaning to the words. All mental effort was impossible.

Autopsy.—Adhesions existed along the longitudinal sinus, gluing the membranes together. These were recent. There was an excess of serum in the cranium, and the brain was small and shrunken. "Below the middle line of the brain, and principally in the middle and posterior lobes, were many spots where the surface was flattened. On cutting into these, the knife passed through a layer of gray cerebral matter which adhered to the membranes, and then entered a cavity whose walls were ill defined. This cavity was bounded on all sides by gray matter, and followed the curves of the convolutions." The process was considered a chronic peripheral encephalitis. (S. W. Mitchell, *Proceedings Path. Soc. Philadelphia*, vol. i. p. 37, 1858.)

CASE XXXVII. *Softening in the Occipital Lobe.*—Male, æt. 63, was suddenly seized with loss of power and sensation in the right side, and a disturbance of sight. The paralysis was not associated with aphasia, and passed off in the course of a month. The visual disturbance and the partial anæsthesia remained. No absolute defect in the visual field was found, but the patient had become colour-blind to green and was diplopic. The visual disturbance consisted of a subjective blurring of all objects seen. "Everything," he said, "appeared dull and hazy." Several months after a tremor developed in the formerly paretic limbs, and right facial paresis appeared again. He became emotional, slow in answering questions, and died six months after the first attack.

Autopsy.—Thrombotic softening involving the median surface of the left occipital lobe, including the cortex bordering the calcarine fissure, the upper edge of the lingual gyrus, the lower half of the cuneus, and the included white substance. The softening reached to within half an inch of the posterior cornu of the lateral ventricle. (N. E. Brill, *Amer. Journ. of Neurology*, vol. i. p. 356.)

CASE XXXVIII. *Abscess of the Occipital Lobe.*—Male, æt. 13. had typhoid fever in May, and in June suffered from headache and dimness of vision in the left eye, which persisted. In July, after a blow on the head, an abscess formed in the scalp in the occipital region, which was opened in September. During August he had daily attacks of general tremor, commencing with pain in the neck and mental excitement, and occasional attacks of vomiting. He died suddenly in September.

Autopsy.—Abscess of the scalp was found, and beneath it the occipital bone was necrosed. Under the necrosed bone there was a meningitis, with adhesion of the membranes to the brain. In the very posterior part of the left hemisphere of the brain was an abscess containing four ounces of yellow pus. It was lined by a membrane, and the white brain substance around was softened to a depth of half an inch. The softening extended two inches anteriorly to the abscess into the white matter. The right lateral ventricle was large and full of serum; the left was smaller. (J. B. S. Jackson, *Boston Med. and Surg. Journ.*, vol. lxii. p. 356.)

CASE XXXIX. *Abscess of the Occipital Lobe.*—Male, æt. 35, was wounded by a bullet in the occipital region, August 19th. He fell, with a momentary loss of eyesight and faintness, but did not lose consciousness, and in a few moments got up and walked away. During the next three weeks he travelled to his home, was able to be up and about attending to business, and complained only of heaviness in the head and disturbance of eyesight. Sept. 7th, he had a chill, a pain in the occiput, and soon became delirious. On the 14th he became comatose, and died.

Autopsy.—A fracture was found in the occipital bone; a limited area of meningitis beneath it; and under the pia a small abscess containing two ounces of pus was found in the brain, involving the posterior lobe of the right side. (Warren, *Boston Surg. and Med. Journ.*, vol. lxxii. p. 100.)

CASE XL. *Tumour in the Occipital Lobe.*—Male, æt. 23, was struck in the head in 1864, but had no symptoms until March, 1868, when headache, very severe in the right posterior part of the head, and dimness of vision, with some unsteadiness of gait, and digestive disturbance, developed gradually. His mind was not affected, but he suffered so much that he became apathetic, and lay in bed indifferent to his surroundings. Nine months after the onset of the headache he began to be very restless, would walk constantly and talk to himself; his intellect and memory began to fail; he no longer recognized friends; and spasms in the muscles of all the limbs commenced and became frequent. There was no paralysis except of the external rectus of the left eye; but his gait was unsteady up to the day of his death. He died in a convulsion, January 16, 1869.

Autopsy.—At a point over the posterior lobe of the right hemisphere the membranes were adherent to the brain, the vessels congested, and a cheesy-looking tumour of irregular shape dipped into the brain tissue to a depth of one inch. The outer part of the tumour was soft and easily broken, leaving a granular mass; the inner part was firm. The brain around it was softened, and the convolutions were obliterated. There was little fluid in the right lateral ventricle as its walls were in close contact. (J. D. Lomax, *Medical and Surgical Reporter*, vol. xxi. p. 93.)

CASE XLI. *Fibroma in the Occipital Lobe.*—Male, æt. 23, was kicked on the head, and suffered afterward from continuous headache with exacerbations, from vomiting, vertigo, and mental confusion, at times amounting to mania. He developed left convergent strabismus, partial right hemianæsthesia with increase of the deep reflexes on the right side. He became blind, first in the right and then in the left eye; choked disks were present. Hearing became defective in the right ear. The temperature over the right parietal region was 0.2° F. above that on the left side.

Autopsy.—A fibroma $2\frac{1}{2}$ inches in diameter adherent to the membranes was found involving the left occipital and posterior parietal regions to within $\frac{1}{2}$ inch of the longitudinal fissure. The brain beneath and around the growth was softened and broken down. The occipital and posterior parietal lobes were almost entirely destroyed, especially in the white matter. (C. K. Mills, *Arch. of Med.*, August, 1882.)

CASE XLII. *Carcinoma of the Temporo-occipital Region.*—Male, æt. 13. A tumour gradually grew upon the cranium to the left of the vertex for four months, and was attended with headache, general muscular pains, and some dimness of vision, which increased to total blindness with exophthalmos. The symptoms increased steadily up to death, but the patient's mind was not impaired, nor was there any paralysis or disturbance of sensation.

Autopsy.—In addition to the tumour of the scalp (a carcinoma) the occipital bone was found to be softened and a second tumour or series of small tumours was found on its inner surface in the substance of the dura. These tumours were not adherent to the brain, but had compressed it so that the convolutions were destroyed by atrophy from pressure. The convolutions involved were the middle and posterior part of the three temporal, the angular gyrus, the posterior parts of the inferior and superior parietal lobules, and the first and second occipital convolutions on the left side. The tumours were soft carcinomata. (M. M. Bagg, *Journal of Insanity*, vol. xxxvii. p. 392.)

CASE XLIII. *Carcinoma of the Occipital Lobe.*—Male, æt. 42. During September, 1880, the patient suffered from continued headache, vertigo, vomiting, and loss of memory. He was admitted to the hospital and examined carefully, but no signs of paralysis, anesthesia, or loss of special senses (except deafness of long standing) were discovered. In November his mental powers failed rapidly, his speech became incoherent, and his memory very faulty. He died of cancer of the liver November 10th.

Autopsy.—The inferior central portion of the posterior lobe of the left side was compressed by an ovoid tumour attached to the membranes, $1\frac{1}{2}$ inches in diameter and 1 inch thick. The central portions of the occipito-temporal convolutions were softened. The hippocampus was touched, but not altered to any extent. The softening had progressed so far as to open the lateral ventricle, the destruction not involving any of the central ganglia, or the crus cerebri. Microscopic examination showed the tumour to be a cylindrical epithelioma. The membranes of the brain were thickened everywhere and the fissures adherent. One corner of the tumour had produced a small superficial spot of softening in the cerebellum. (H. F. Formad, *Phil. Med. Times*, vol. xi. 274.)

CASE XLIV. *Sarcoma compressing the Occipital Lobes.*—Male, 56; suffered for $1\frac{1}{2}$ years from a tumour of the occiput which gradually increased in size, but gave rise to no brain symptoms. An attempt to remove this failed as it was found to have penetrated and eroded the skull. After the operation the patient remained in the same condition for four weeks, then lost the power of motion and sensation on the right side for a week, but recovered them, and finally six weeks after the operation developed a left hemiplegia and died in three days.

Autopsy.—Sarcoma of the dura mater had eroded the skull for an area of two square inches. The tumour arose from the falx cerebri, and had extended between the hemispheres to a depth of $1\frac{1}{2}$ inches, flattening the convolutions on either side in the occipital region. On incision an abscess the size of a pigeon's egg was found in the "left posterior central convolutions."¹ (E. N. Brush, *Amer. Journ. of Insanity*, vol. xxxvi. p. 342.)

CASE XLV. *Glioma of the Occipital Lobe*—Female, æt. 34, began to suffer from very severe headache recurring in paroxysms every day or two in January, the first attack being accompanied by nausea and disturbance of vision, the latter symptom lasting two days. These symptoms continued during February, the pain at times being agonizing. On March 3, it was noticed that the right pupil was dilated, and ptosis with paresis of the muscles of the eyeball developed soon after. On the 6th choked disk was found. From this time she became stupid, swallowing became difficult, and she suffered from pain in the neck and shoulders.

¹ The median surface of the occipital lobe is probably intended.

The average surface temperature of the head was 6.4° Fahr. above normal, being highest over the right occipital region where it was 100.5° Fahr. On the 16th she became comatose and died.

Autopsy.—Meninges normal. The whole right occipital lobe was elastic and fluctuating, and while being examined gave way, and an ounce of softened brain substance and a colloid material exuded. A soft colloid tumour of the size of a hazel-nut was found between the horizontal or posterior branch of the fissure of Sylvius and the first temporal fissure. The whole right occipital lobe was softened and disintegrated, and the tumour projected into its substance. The line of demarcation between the tumour and the brain was marked by the tortuous vessels supplying the growth. It was a glioma. (F. W. Rockwell, *Trans. N. Y. State Med. Soc.*, 1879, p. 114.)

The most prominent local symptom of lesion of the occipital lobes is a disturbance of vision. This was present in eight of the cases here cited. In two of these cases the lesion was a tumour, and choked disks were discovered on examination, but in the cases of softening and of abscess no such explanation can be offered for the symptom. From a study of twenty-seven cases of lesion of the occipital region collected from foreign sources, it has been shown¹ that lesions of one occipital lobe produce blindness of the like-named halves of both retinae. In the cases here collected no determination of the visual field was made, the examination having been incomplete. The exact defect of vision in the foreign cases was not noticed by the patients, the chief complaint in all cases being of a disturbance of sight in but one eye. This was also the complaint in two of these cases, and as the visual field was not measured it is impossible to determine whether the symptom was unilateral or bilateral. Greater care in the examination of the special senses is necessary. But although no statement can be made as to the exact disturbance of vision, the American cases indicate a connection between the lesions of the occipital lobe and blindness, and thus do not oppose the conclusions drawn from a study of foreign cases.

An absence of motor or sensory disturbance, except the affection of vision, is to be noted in cases of occipital lobe lesion. In but two cases was paralysis present, and in one of these cases it cannot be referred to the occipital lesion, since this was a tumour of slow growth, while the hemiplegia developed but three days before death, while in the other case it was only a temporary symptom. Certain anatomists have traced a portion of the tracts supposed to convey general sensory impulses to the occipital region. The absence of symptoms of general anaesthesia in the large majority of both foreign and American cases of lesion of the occipital lobes throws doubt upon this conclusion. As yet there are too few pathological facts to demonstrate the localization of the areas of general sensation in the occipital region. The mental symptoms which presented themselves in three of the cases differed from those which were produced by frontal lesions. They consisted in loss of memory and occasional onsets of maniacal excitement. In one case it is stated that the patient failed to recognize his friends.

¹ The Visual Area of the Brain, M. A. Starr, *Amer. Journ. Med. Sci.*, Jan. 1884.

These cases warrant the conclusions that the visual area lies in the occipital lobes, and that the areas governing speech, motion, general sensation, and non-visual sensory impressions lie elsewhere.

Foreign observers have noticed, in many cases of affection of the occipital region, a loss of memory of objects recognized by sight while auditory or motor memories were not affected.¹ These facts have led to the hypothesis that various kinds of memories are located in various regions, the memories of objects perceived by the different senses being stored up in the portions of the brain in which those sense perceptions were originally received. It has been already shown that lesions of the temporal region in which auditory impressions are received may give rise to sensory aphasia or loss of memory of the sound of words. Cases of loss of memory of the appearance of words, and consequent inability to read and write, while all the other mental faculties were preserved, are on record, and in the three cases in which an autopsy was made a lesion of the angular gyrus which lies at the junction of the occipital, temporal, and parietal regions was found.² In the following case this symptom was present for a time, but passed away, and the original occurrence of the aphasia and agraphia, as well as its disappearance, is referred to a temporary pressure on this region by a hemorrhagic clot which was afterward absorbed. The case is also of value as an illustration of a form of aphasia which is neither purely motor nor purely sensory, but has been described by Kussmaul as paraphasia, and by Wernicke as aphasia of incoördination,³ and which consists in the tendency on the part of the patient to substitute irrelevant words for those which he wishes to say.

CASE XLVI. Paraphasia. Agraphia.—Male, was suddenly attacked with inability to make himself understood. He could articulate perfectly, could put words together, and could understand what was said to him, but when he tried to talk, wrong words were substituted for those which he desired to use, and words were not used in their right relations. He noticed at the same time some loss of memory of words, *e. g.*, the first person plural of a Greek verb. There was also an inability to write a sentence correctly, as he substituted a wrong word for the one dictated, and wrote wrong letters in a word. On one occasion he had an hallucination of vision which he perceived as such. He had no paralysis. Sensation was not tested. He gradually recovered, and three months after the attack was perfectly well. He was eccentric and excitable, and not long after his recovery committed suicide.

Autopsy.—Pia mater thickened, but not adherent to the brain, except at one or two spots in the temporal region. Numerous miliary aneurisms on the small arteries, and vacuoles in the brain substance were found. In the left hemisphere, at the posterior extremity of the Sylvian fissure in the supra-marginal convolution, a cavity, three-quarters of an inch in diameter, filled with dark serum, and a meshwork of fibrous tissue, was discovered. This extended into

¹ Fürstner, Arch. f. Psych., viii. ix. Reichart, Arch. f. Psych., ix. Stenger, Arch. f. Psych., xiv.

² Déjevine, Arch. de Neurol., No. 6; Chauffard, Rev. de Méd., Nov. 1881; Magnan, Gaz. Méd. de Paris, Dec. 1879.

³ Leitungsaphasie, Lehrbuch d. Gehirnk., vol. i. p. 205.

the white substance toward the lateral ventricle. A small, old hemorrhagic focus was also found in the right lenticular nucleus. (S. G. Webber, *Boston Med. and Surg. Journ.*, cix. p. 581.)

IV. PARIETAL LOBULES.

Few cases of lesion limited strictly to the parietal lobules are recorded. Those that were found in American journals are chiefly of negative value, and indicate that the posterior limit of the motor area does not extend beyond the posterior central convolution. No definite function has been assigned to this region of the brain, and the symptoms which have occurred in the majority of foreign cases, like those which have been described in the four cases of lesion of the supra-marginal convolution already given,¹ have been ascribed rather to the destruction of convolutions connecting these lobules with the temporal or occipital regions. When a lesion of this region involves the posterior central convolution, motor disturbances occur. In a few cases slight disturbances of sensation have followed lesions of these lobules. They may have been due to an extension of the disease to the central convolutions. No cases are found to confirm the statement of Landouzy, that a motor area governing the movements of the eyes and muscles of the lids lies in the inferior parietal region. The following cases are cited without further comment.

CASE XLVII. *Abscess in Parietal Region.*—Male, æt. 12, fell upon a nail, which was driven into the right parietal bone, a little posterior to the protuberance, penetrating the brain $1\frac{1}{4}$ inch. He walked home, and for three weeks suffered from general symptoms of encephalitis without local symptoms. He then recovered, and for three months was in perfect health, both mental and physical condition being good. He then was suddenly seized with frontal headache, and died in three days.

Autopsy (33 hours p. m.).—The middle and posterior lobes of the right hemisphere were softened to a consistence of cream and nearly diffuent. At a depth of $1\frac{1}{2}$ inch beneath the old wound of the skull, an abscess, containing 4 ounces of pus, was found in the brain. The abscess was not limited by a membranous wall, but its sides were made up of denser brain substance. (Downs, *Amer. Journ. of Med. Sci.*, Oct. 1871.)

CASE XLVIII. *Abscess in Parietal Region.*—Male, æt. 25, was kicked by a horse, and had a depressed fracture of the right parietal bone on July 3d, after which he suffered from symptoms of meningitis without local paralysis, from which he recovered, and on the 29th went to work. During August he had much headache on the right side, and felt weak. September 30th came back to hospital on account of the pain in his head, and on October 4th was trephined with result of relieving the pain. October 21st, after an attack of tonic spasm of the left arm, without motor or sensory paralysis, he became comatose and died.

Autopsy.—An abscess, $1\frac{1}{2}$ by 1 inch in diameter, was found in the right posterior central and inferior parietal convolutions, near the gypsus supra-marginalis, enclosed in a firm capsule. The brain around it was softened, but the cortex was not involved. (J. S. Wight, *Medical Gazette*, ix. p. 558.)

CASE XLIX. *Tumour Compressing Parietal Regions.*—Male, æt. 45, fifteen years before the appearance of symptoms, had been kicked on the head by a horse. Fifteen months before death a small hard tumour of the scalp in the central line just posterior to the vertex appeared and increased in size. During the following year he suffered from very severe headaches, and gradually lost the sight of the right eye. He applied for treatment on account of the tumour, which

¹ Cases XX., XXXIV., XLI., XLVI.

had grown to be $3\frac{1}{2}$ inches in diameter at its base, and on account of the headache, and disturbance of vision which was affecting the left eye as well as the right. There were no other brain symptoms. No ophthalmoscopic examination was made. The tumour, an ivory exostosis, was removed, and the patient recovered from the anæsthetic, and was conscious. The next day he had a convulsion, and thirty-seven hours after the operation he died, having been rational until the end.

Autopsy.—The dura was thickened at a point opposite the situation of the external tumour in the middle line. On cutting through the dura a tumour was found situated in the great longitudinal fissure between the hemispheres, attached to the falx cerebri, and obliterating the longitudinal sinus for a distance of $3\frac{1}{2}$ inches in its third quarter from the front. The tumour was firm, yellow, $3\frac{1}{2}$ by 3 inches in size, and had compressed without destroying the adjacent brain tissue to which it was not adherent, and which was everywhere healthy. Microscopical examination showed it to be a carcinoma. (C. E. Isaacs, *Trans. N. Y. State Med. Soc.*, 1859, p. 82.)

The superior parietal lobules posterior to the paracentral lobules must have been compressed.

CASE L. Atrophy of the Parietal and Temporal Regions.—Female, æt. 34; in July, 1879, she lost power in her right arm and hand, and soon after had an attack characterized by sudden loss of consciousness, which lasted two weeks (?), after which she was found to be paralyzed on the right side, deaf, and to be insane, talking incoherently, and having hallucinations of sight and hearing. There were no convulsions. The paralysis gradually passed off, but she became blind and deaf. On admission to the asylum, Sept. 1879, the patient was found to be very stupid, quite blind and deaf, and in poor physical condition. She gropes about, talks disconnectedly, screams, and is dirty. During October, she had an epileptic convulsion, beginning in the right side, and in November a second more marked in the left side of the face. There was at this time paresis of the right hand. Tactile sensibility was preserved. In January, 1880, she had a severe convulsion, followed by contracture of the right arm, which lasted seven days and then disappeared, leaving no signs of paresis anywhere. She remained in the same condition, becoming more noisy and stupid, until September, 1881, when she died of pneumonia.

Autopsy.—Slight meningitis everywhere. Remarkable atrophy of the superior and inferior parietal convolutions on both hemispheres. The upper part of the posterior central on the left side, and the lower part of the posterior central on the right side were also slightly atrophied, but this atrophy was limited to a very small area. The first temporal convolutions on both sides were atrophied to one quarter their normal breadth. "Microscopic examination showed that in these regions the gray cortical matter had entirely disappeared, leaving its outer layer attached to the pia mater, and lying next to the white substance, which was found to contain nuclei of all sizes." The perivascular spaces were dilated and filled with nuclei. Optic nerves were atrophied. (J. C. Shaw, *Arch. of Medicine*, Feb. 1882.)

While certain direct local symptoms of disease in the frontal, temporal, occipital, and parietal regions of the brain have been found by a study of these fifty cases, the important fact is also presented that the areas governing motion and general sensation must lie in other parts. The method of exclusion indicates that these areas are to be found in the central convolutions. But positive facts are not wanting to support this conclusion. We shall, therefore, in a future paper consider the lesions of the motor area.

ARTICLE VI.

SCARLATINA PUERPERALIS. By SAMUEL C. BUSEY, M.D.,
of Washington, D. C.

THE term *Scarlatina Puerperalis* was originally applied to a form of puerperal fever which was believed to be modified and intensified by infection with the scarlatinal poison, and which was frequently confounded with an occasional puerperal affection very closely resembling scarlet fever. Hence two distinct opinions have been advanced: One that it was a puerperal fever allied to pyæmic or septic conditions to which the scarlatinous poison added virulence, and which would produce in a susceptible person scarlet fever pure and simple. The latter opinion is that it is nothing more than scarlet fever attacking a lying-in woman, and modified by the puerperal state, but in no manner connected with or caused by pyæmia or septicæmia. Each of these theories is maintained by authors of equal repute at the present time, and some claim the occasional occurrence of both forms of an acute puerperal disease characterized by the scarlatinous eruption and angina. As a contribution to the study of this rare complication of the puerperium, I present the following report of a case, the second of the kind which I have seen.

CASE.—Mrs., aged 33, gave birth to a well-developed male infant at half past two o'clock A. M., Sept. 6, 1883. The labour was natural. On the day previous, about noon, I saw her in her parlour, and was informed that she had been awakened about 3 A. M. by a slight pain, followed by several very copious liquid stools. The diarrhœa had ceased, but the pains had continued at irregular intervals, and there was a slight "show." I directed her to retire to her chamber, send for the nurse, and prepare for the coming event. Late in the afternoon the pains assumed the definite character of labour-pains, and the os was dilated to about the size of a silver quarter of a dollar piece. At 11 P. M. I was summoned, and found the os dilated to the size of a silver dollar. The pains were strong and at short intervals. From this time the labour progressed without any unusual occurrence until 2 A. M., 6th. At this time the administration of ether was begun. The exit of the head was delayed by a rigid perineum, and efforts were made to delay its extrusion, but it finally escaped at 2.30, causing a laceration of the perineum, not, however, of sufficient extent to demand immediate stitching. One hour after the completion of the labour her pulse was 76. During the 6th, 7th, and until 8 P. M. of the 8th, she was as well as the most favourable cases after parturition, excepting inability to pass her water. This was probably due to the pressure of the head against the urethra, caused by the rigid perineum and efforts to resist the expulsive force. On the evening of the 8th inst., her pulse rose to 84. The breasts were full, tense, and tender. The nipples were painful during the act of nursing. An enema of tepid water was ordered, which produced a copious stool; a saturnine lotion was applied to the breast, and the nurse was directed to secure

the evacuation of the breast by gradual manual pressure, and, if that failed, by suction with her own mouth.¹

9th. 4th day,² 10 A. M. Temp. 101.5°; pulse 96. Passed a more uncomfortable night than usual. Breasts firm, more painful. Milk abundant; child nursed regularly. Passed water for the first time voluntarily. No unusual abdominal tenderness or pain. Lochia as usual at this period. Continued the saturnine lotion, with directions to nurse to prevent painful accumulation of milk. At 11.30 she had a chill, characterized by a sense of slight chilliness, cold feet, and oppressed breathing, which she described as a feeling of suffocation similar to that felt when taking ether. As I entered her room at 1.30 P. M., she expressed regret that I should have been sent for, as she had recovered from her nervousness, and felt entirely relieved. Her face was flushed; skin hot and dry; temp. 103°; and pulse 112. The lochia was inoffensive; vagina hot, but not unusually tender. The perineal tear was sore. A finger was introduced as far as possible through the cervix, and when withdrawn presented no evidence of any putrescence. The abdomen was flaccid, and entirely free from any but the ordinary conditions in such cases. Ordered 10 grs. of the hydrochlorate of quinia immediately, and 5 grs. every six hours thereafter. At 8 P. M. the temperature had fallen to 101.5°; the pulse was 96. She was sweating profusely. The breasts were free from pain, less tense; milk abundant. The child nursed well and regularly every two hours. Fearing that the alimentary tract might not be entirely free, I gave a pill consisting of blue mass and extract of rhubarb, each three grains, and continued the quinine every six hours.

Vaginal injections of carbolized tepid water had been given daily since delivery, and several times each day the external genitalia had been cleansed with similar fluid.

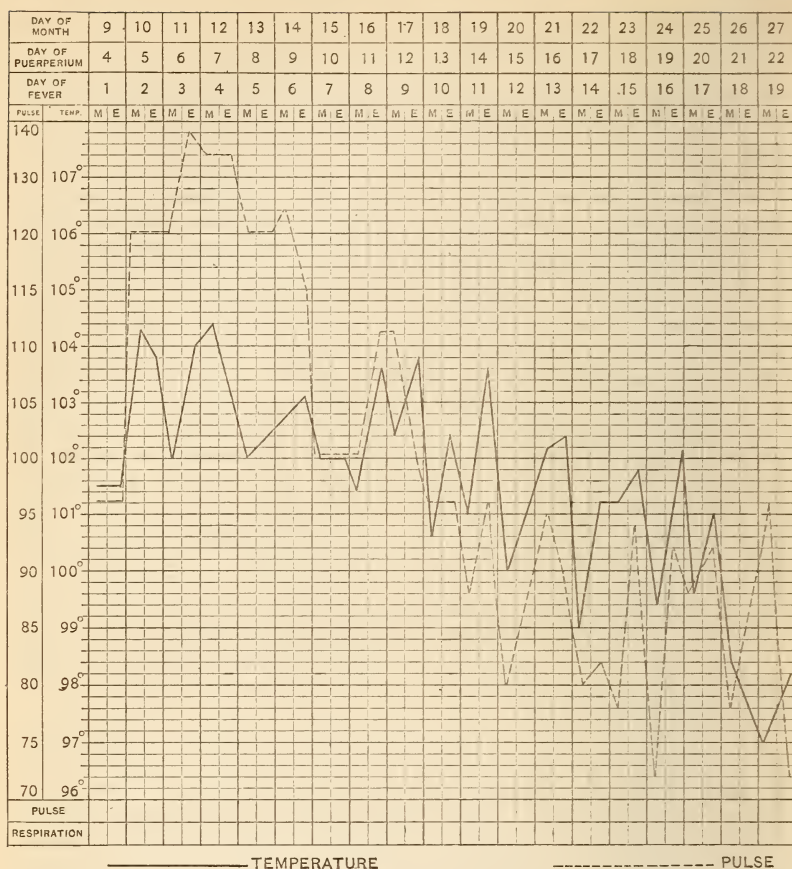
9th. 5th day of lying-in; 2d day of the fever;³ 10 A. M. Temp. 104°; pulse 120. No abdominal pain or tenderness, no tympanites. Lochia as previously described. Breasts soft and entirely free from inflammation. Tongue moist and clean. Upon laying aside her gown I discovered an indistinct scarlatinous eruption covering both breasts and entire front of chest, less distinct about the neck, and not extending above the covered part. In answer to a question she replied that her throat was not sore, but felt dry. Inspection revealed nothing.⁴ She was very thirsty, and complained of the unpleasant effects of the quinine. No movement from the bowels. I could not discover any local condition which would justify the suspicion of septic poisoning, but, fearing that it might be concealed,

¹ The best breast pump I know of is the mouth of the nurse. I have often failed to make the nurse discharge this important duty, but when I have succeeded, the result has been entirely satisfactory. I knew a husband whose affection and sympathy for his suffering wife induced him to apply his mouth, and the result was equally good. Once I succeeded with a pair of puppies, between which and the patient there grew a devotion and attachment akin to those of mother and offspring. Breast pumps as often do harm as good. The suction of the breast by the nurse should be made a part of the curriculum of the training schools for nurses.

² The days began at 2.30 A. M.

³ The beginning of the eruptive fever is dated from the initial chill the day previous. A rigor is the most common initial symptom.

⁴ She said she had had scarlet fever, which statement was subsequently confirmed by her father and brother.



and knowing that a putrescent odour of the lochia was not always present, I determined to wash out the cavity of the womb, but, not having the necessary apparatus with me, I continued the treatment. At 12 o'clock I returned, and with the assistance of Dr. Charles E. Hagner, whom I had invited to see the case with me, proceeded to disinfect the uterine cavity. At this time the temp. was 103.8° , and pulse 112. A Chamberlain intra-uterine tube was introduced, and the womb was washed out with a one to forty solution of carbolic acid. A digital examination made immediately after disclosed the fact that the cavity was not entirely clean. The tube was reintroduced into the cavity again, and thoroughly washed. The eruption and throat symptoms were about as when first observed. 8 P. M. Temp. 103.8° ; pulse 120. She had had three copious liquid stools, preceded by and attended with slight pain. The eruption was distinctly scarlatinous, covered the entire trunk, but did not extend above the margin before referred to, and not below the body. Tongue moist and clean. Throat affection more marked. Discontinued quinine because of cerebral disturbance, and ordered 10 grs. salicylate of soda every three hours, and powders of 2 grs. of chlorate of potash to be put dry upon the tongue, the two to alternate at one and a half hour interval, unless she was

asleep. Also a mixture of the subnitrate of bismuth grs. x, and five drops of the deodorized tincture of opium as often as might be necessary to control the diarrhœa. The diet of beef-tea, mutton or chicken broth, or milk with lime-water, was continued. Cracked ice at pleasure.

11th. 6th day; 3d day of fever, 10 A. M. Dr. H. in consultation. Temp. 102°; pulse 120; passed a comfortable night. Two slight liquid stools since last visit; throat red and punctated; tongue covered with white fur; pelvic and abdominal conditions as before; if any change, less of the ordinary sense of soreness upon manual pressure. Lochia unchanged. Passed water naturally; breast in good condition; nipples tender. Is fretted by the nursing of the child; thinks there is abundant flow of milk, but the dragging of the infant at the nipples indicates insufficient supply. The eruption intensely red over entire trunk, and extending along the thighs. Cheeks flushed; marked paleness about mouth. Cinchonism diminished, nearly disappeared; treatment and diet continued. Ordered injunction of the body with benzoated lard.

1 P. M. Temp. 105°; pulse 132. Suspended the salicylate of soda; ordered 10 grs. of the sulphate of quinia. The face to be affused, at pleasure, with cold water strongly impregnated with bay rum.¹ 4 P. M. Temp. 104°; pulse 132. At both the one and four o'clock visits, the child was nursing. At the latter visit, the eruption covered the thighs, and was extending along the leg. On the trunk it was deeper in colour than previously. No delirium; food taken every two hours.

8 P. M. Dr. H. present; temp. 104°; pulse 136; tongue heavily coated, and along edges and at tip papillæ enlarged, and a few showing through the coating; complains much of the quinine. Face more flushed, and the difference in colour about the mouth more marked. One liquid stool since last visit, after which a dose of the bismuth mixture was given, as had been done since the diarrhœa set in; the condition of the abdomen as before. Lochia less sanguineous, but emitting a faint, disagreeable odour. Continued bismuth mixture as might be needed. Ordered a mixture of chlorate of potash one drachm, tincture of the chloride of iron two drachms, with equal parts of water and glycerine, making a four-ounce mixture, of which one teaspoonful was to be given every four hours. The vaginal carbolized injection to be repeated, and, if delirium should occur, thirty grains of the bromide of potash. Nutriment, ice, carbonic acid, or Apollinaris water, as before, and the affusions at pleasure. Removed the child from the breast, because of tenderness of the nipples, insufficient supply of milk, and fretting of the patient. Nurse directed to empty breast.

12th. 7th day, and 4th day of fever, 10 A. M. Dr. H. present. Temp. 104.3°; pulse 136. Tongue presented the character of a strawberry tongue; throat deeply congested, but slightly swelled. Eruption covering entire surface; sudamina over trunk densely thick. Lochia as before stated; much flatus; lacteal secretion suppressed. As I entered the room, she greeted me with the expression that she had had a very comfortable night, and was much better early in the morning, but that the inability to pass water (which had not occurred since the previous mention), and the failure of the nurse to introduce the catheter had fretted her, and brought

¹ I have frequently, in cases of high temperature, especially in children, derived marked benefit from frequent bathing of the face and head with cold water, mixed with bay rum. The evaporation is very rapid, and heat is rapidly lost.

back the fever. I drew off 16 ounces of highly coloured urine.¹ Continued the mixture of iron and chlorate of potash; cracked ice, carbonic acid, or Apollinaris water at pleasure, and the volatilized affusions and diet as before. Ordered, in addition, five grains of the sulphate of quinia and one drachm of Fothergill's solution of hydrobromic acid every two hours. Sensorium not disturbed; no delirium during night.

1 P. M. Temp. 103.6°; pulse 136, somewhat unsteady and irregular. Introduced catheter, and drew off six ounces of urine; increased the interval of the quinia mixture to three hours, and added fifteen minims of the tincture of digitalis to each dose.

4 P. M. Temp. 104.2°; pulse 132, regular, tension improved. Increased interval of quinia mixture to four hours, to which, at 8 P. M., add fifteen minims of the tincture of digitalis. This would make twenty grains of the sulphate of quinia, four drachms of the hydrobromic acid, and thirty minims of the tincture of digitalis since 11 A. M. same day. Repeated the vaginal injection and inunction; lochia emitting a more offensive odour. The patient is quite bright and cheerful, but complains of the flatus and the pain occasioned by it as it courses through the intestines. 8 P. M. Dr. H. present; temp. 103°; pulse 136. Complaints of increased pain occasioned by flatus, and also of soreness of throat; but on inspection the redness and swelling appeared less; lochia more offensive. Discontinued iron and potash mixture and animal broths; continued quinia and acid mixture and digitalis every six hours. Ordered milk-punch every six hours, and milk and lime-water in the intervening hours; and, if the annoyance occasioned by the flatus did not subside, a rectal injection of tepid water and one drachm of the tincture of assafœtida.

But for the falling temperature an intra-uterine carbolized injection would have been administered. In view, however, of this fact, it was not believed to be imperative, and was postponed until the following morning.

13th. 8th day, and 5th day of the fever, 6.30 A. M.; temp. 102.4°; pulse 120, tension good; four stools during night. Passed a more comfortable night than the previous one; flatus and pain disappeared; drew off six ounces of urine; no change in medicine; London beef extract added to diet.

The change made in the diet the night before and the suspension of the iron mixture were made because of the suspicion that the flatulence might have been produced by them.

10 A. M. Dr. H. present. Temp. 102°; pulse 120; feeling much better; throat improved; lochia diminished, odour the same; treatment continued. The continued fall in the temperature, diminished frequency of the pulse, and improved condition of patient induced us to defer the intra-uterine injection.

1 P. M. Temp. 102.2°; pulse 120. Condition unchanged; treatment continued; drew off six ounces of urine.

¹ This quantity was evidently due to the neglect of the nurse, and probably to deception practised in the statement that she had emptied her bladder several times the previous afternoon.

Colour, deep yellow; reaction, very acid; sp. gravity, 1026; chlorides, diminished; phosphates, diminished; urates, increased; albumen, small quantity; sugar, none; sediment, flocculent.

Microscopical Examination.—Few epithelial casts; some granular ones. Epithelium from kidney, ureter, and bladder; few leucocytes; few blood-corpuscles.

4 P. M. Temp. 102.6° ; pulse 120. Condition unchanged; dismissed nurse.

8 P. M. Dr. H. present. Temp. 102.4° ; pulse 120. Suspended quinia and acid mixture until 6 A. M.

Punch at five hours' interval; one stool, more consistent; drew off six ounces of urine, lighter colour. In consequence of the change of nurse, some confusion. Vaginal injection and inunction not given, as ordered, in the afternoon; renewed the orders; diet continued.

14th. 9th day; 6th of fever. Dr. H. present. Temperature 102.6° ; pulse 124. Tongue red; throat improved. One slight stool. Catheter introduced at 3 and 11 A. M.; one ounce drawn at the first, and three ounces at the last time. No lochial discharge since vaginal injection at 9 the previous evening, but little then. Passed a bad night; was restless and hot; slept but little before 3 A. M. Complains of disagreeable dryness of tongue and fauces. Some tympanites. No pelvic or abdominal pain or tenderness. The water from the vaginal injection this morning returned clear and odourless. Fearing there might be retention of the lochia¹ I washed the uterine cavity, using a double canulated elastic tube and a fountain syringe. The water returned nearly colourless, odourless, and containing a few whitish flakes, looking like inspissated pus, and fewer reddish particles. Suspended quinine and hydrobromic acid mixture, and digitalis. Ordered 10 grs. of the acetate of potash in half ounce of the spiritus Mindereri every two hours; sponging of the entire surface with warm water, and a hot flaxseed meal-poultice to the dorso-lumbar region. Diet and punch as before. Mouth to be rinsed at pleasure with a mixture of glycerine, rose and pure water. Sensorium undisturbed.

1 P. M. Temp. 102.8° ; pulse 114. Patient expressed herself as feeling entirely comfortable, having derived more pleasure from the sponging than from anything which had been done for her since her illness. She desired sleep and rest. Deafness caused by the quinine nearly entirely gone. I drew off seven and one quarter ounces of highly coloured urine, the analysis of which, by Dr. Acker, was as follows:—

Colour yellow; reaction acid; sp. grav. 1015; chlorides diminished; phosphates diminished; urates increased; albumen very small quantity; sugar none; sediment flocculent.

¹ Recent observation had taught me that the absence of a lochial discharge must not be accepted as conclusive against its presence, when a puerperal woman is seized with a chill followed by fever. The case was as follows: A lady was up and about her chamber, feeling quite well. During the night of the twelfth day after her confinement, she had two chills, followed by free sweating. On the morning of the 13th day her temperature was 101.5° . There was no vaginal discharge nor any unhealthy condition discovered by a careful digital examination, not even by the introduction of the finger far into the cervix. Ordered 5 grs. of the sulphate of quinia every six hours, rest in bed, and a fluid diet. On the next morning, at the same hour of the day, her temperature was 103.5° . She had taken 24 grains of quinine, but the temperature had risen one-and-a-half degree. A careful digital examination and inspection through a speculum were negative. I introduced a double canulated elastic intra-uterine tube, and with a Davidson's syringe threw in carbolized water, washing out a small quantity of a sanguineo-purulent and stinking fluid. The temperature fell to nearly normal in the afternoon, and was normal the next morning. I again washed out the cavity. Nothing more was needed. The patient was up in two days, and has enjoyed good health since.

Microscopical Examination.—Several epithelial casts. Epithelium from kidney, ureter, and bladder; leucocytes.

Suspended the milk-punch, which was to have been taken at this hour. Continued the beef extract, milk and lime-water, and the acetate of potash mixture.

The quantity of urine seems large to have been secreted since 10 A. M., at which time the nurse obtained only three ounces. She is a trained nurse, accustomed to the use of the catheter, and very reliable. I was surprised; but she insisted that there could be no mistake, either then or at the 3 A. M. attempt. At this visit I attended to it myself, with the result above stated. This, with the quantity drawn at different times during the earlier part of the twenty-four hours, made forty ounces for the day ending at 1 P. M. This is less than it had been for any day since the initial chill. Only eleven ounces could have been secreted since 9 o'clock the night before.

4 P. M. Temp. 103°; pulse 120. One very slight dark liquid stool. Patient said she was feeling much better, was gaining strength, breathed better, had turned herself over on her side and slept. Intellect perfectly clear. At her request, a weak mint julep was ordered. The sponging and vaginal injection were ordered to be repeated. Medicine and diet continued as at last visit.

8 P. M. Dr. H. present. Temp. 103°; pulse 114. Two very slight stools. Nurse drew off sixteen ounces of urine, less coloured. Tympanites diminished. No return of lochia. No discharge from os. Epidermis peeling off buttocks in large flakes, leaving a moist and intensely red surface. Had slept some since 4 P. M. Continued potash mixture, and ordered the sponging to be repeated every three or four hours, and a pledget of absorbent cotton saturated with Listerine to be applied between pudendal labia and surfaces of the perineal tear. Diet continued.

15th. 10th day; 7th day of fever; 10 A. M. Dr. H. present. Temp. 102°; pulse 100. A good night. Throat well; tongue improved; one stool; urine drawn by nurse, twenty-five ounces at 2, and twenty ounces at 8 A. M., making in all sixty-eight ounces since 10 A. M. 14th. Feels much improved. Desquamation free on face, chest, and abdomen. Eruption about buttocks losing colour. Tympanites less. No lochia. Patient bright and cheerful. Treatment, as last ordered, continued.

1 P. M. Temp. 102.2°; pulse 102. One stool, slight, more consistent, black. Treatment continued.

4 P. M. Temp 101.8°; pulse 102. Twenty-four ounces of urine drawn by nurse at 2 P. M. One stool. Feeling improved. Suspended potash mixture.

8 P. M. Temp. 102°; pulse 100. One very small stool. Some tympanites. Sixteen ounces of urine drawn by nurse at 6.30 P. M. Treatment as last directed continued.

16th. 11th day; 8th day of fever; 10 A. M. Dr. H. present. Temp. 101°; pulse 100. Two quite consistent stools. Slept well. Urine drawn by nurse at 11 P. M. 15th, twenty-one ounces; at 4 A. M. 16th, seventeen ounces, and at 9.30 A. M. twenty-four ounces, making in last twenty-four hours one hundred and two ounces. Sponging, vaginal injections, and diet had been continued as usual. In addition to the diet, allowed milk toast; and at request of patient a weak julep.

1 P. M. Temp. 102.2°; pulse 106. One stool, consistent and partially formed. Desquamation progressing. The temperature is precisely the

same as at the same hour yesterday, but the excursion is one degree greater. The julep had been taken, but not the toast. No cause could be discovered for the difference. It will be observed that a somewhat similar rise took place on Friday, following a lower range on the day before, but it was less rapid and not so great. Then it was believed to have been caused by the renal congestion.

4 P. M. Visit unavoidably omitted.

8 P. M. Dr. H. present. Temp. 103.6° ; pulse 112. One stool at 6.30; character similar to the last described. Urine drawn by nurse at 2.30 seventeen ounces, and at 6.30 sixteen ounces. Thirst intense; tongue dry; skin hot and dry. Had passed a very uncomfortable afternoon; very restless; complains of the heat of the room (day very hot). Tympanitis not increased. No pain; no abdominal or pelvic tenderness; no lochia; no chill; no swelling of any superficial glands; no pain or tenderness upon deep inspiration. Breast flabby and painless. Very talkative; dreams and talks during sleep. Says people talk to her while asleep; she answers them, and is awakened by her own words. Perineal tear perfectly healthy. All directions have been strictly complied with. The spongings had been given every four hours, and the usual afternoon carbolized injection. Washed out womb with a one to forty carbolized solution. A very small quantity, less than one drachm, of bloody fluid at first, but afterwards the water returned perfectly clear; no odour but that of the injected fluid could be distinguished. Ordered ten grains of the hydrochlorate of quinia immediately, and five grains every two hours until twenty grains are taken, and then the same dose every six hours; sponging every two hours; diet as before.

17th. 12th day; 9th day of fever, 10 A. M. Dr. H. present. Temp. 102.4° ; pulse 112. Two stools, copious and liquid; some pain in rectum during act of defecation. Was very restless and talkative until midnight; after that time quiet and slept much. Urine drawn by nurse at 12.10 A. M. fourteen ounces, and at 5 fifteen, and by me at 10 nineteen, making eighty-three ounces in last twenty-four hours. At last vaginal injection nurse noticed much flocculent matter in water. Patient was lying on right side and comfortable, but complained of discomfort in right iliac fossa when upon left side. Middle hypogastric region tender on pressure; some tenderness in right iliac fossa, and apparently a sense of firmness. By bi-manual examination this firmness was more distinct and very tender. The vaginal roof was nowhere tender, but the posterior wall along lower part of rectum slightly so. Washed out womb; two or more drachms of colourless pus. Ordered hot vaginal injections every four hours, and hot flaxseed-meal poultices to hypogastrium. Sponging continued. Diet same. Quinine suspended, owing to cerebral disturbance.

1 P. M. Temp. 102.6° ; pulse 112. Slight rectal pain caused by escape of flatus, preceded always by abdominal pain and borborygmus; pain in right iliac fossa on deep inspiration. In dorsal or right lateral decubitus no pain is felt, except as above stated. Ordered eight drops of the deodorized tincture of opium if the pain recurred, otherwise no change.

4 P. M. Temp. 102.8° ; pulse 104. No pain since taking the opiate. Drowsy. Urine drawn by nurse at 2 P. M., eighteen ounces; colour very light, as it has been for several days.

8 P. M. Dr. H. present. Temp. 103.6° ; pulse 100. Thinks she is better. No pain except upon full inspiration, but less and confined to one point far to the right in the iliac fossa. Urine drawn, thirteen ounces,

very clear; no stool; no pain in rectum. Tongue less dry; thirst less. Washed out womb; more pus than in the morning, more colour, and some flakes. Ordered hot vaginal injection and sponging to be repeated at 9, and then both to be suspended until to-morrow. Liquid diet and poultices continued, and the opiate sufficiently often to secure freedom from pain and quiet. Examination of pelvic organs and palpation of abdomen omitted. Sensorium undisturbed.

18th. 13th day; 10th off fever, 10 A.M. Dr. H. present. Temp. 100.6°; pulse 96. Passed best night since fever began. Feels much better. Tongue pale. Skin pleasant. One very small stool. Less tympanites. No complaint of pain or soreness. Improved appetite. Urine drawn by nurse at 3 A.M., eighteen, and at 9 A.M. fifteen ounces, making in last twenty-four hours sixty-four ounces. Washed out womb; less pus; less colour. Continued treatment of yesterday. Did not see the patient again until 25th, in consequence of absence from the city at the meeting of the American Gynæcological Society. The following notes were taken by my colleague, Dr. C. E. Hagner, who had charge of the case during my absence.

3 P.M. No action on bowels since 2 A.M. P. 96; temp. 102.8°.

8 P.M. Uterine injection used. P. 96; temp. 102.4°.

19th. 9.45 A.M. Uterine injection used. Pulse 88; temp. 101°.

6.45 P.M. Cool at 2 P.M. Ten drops tinct. opii deod. Action at 6 P.M. Uterine injection. P. 96; temp. 103.6°.

20th. 10 A.M. P. 80; temp. 100°. Ten grains of quinia given at 6 A.M. Urine greenish. I thought it best not to give injection.

1.15 P.M. P. 86; T. 101.5°.

6.45 P.M. P. 88; T. 101°. Pain in iliac fossa. No injection given. Urine decidedly green.

21st. 9.55 A.M. P. 96; T. 102.2°. Has taken ten grains of quinia. Urine of natural colour, so used injection as the temperature was high.

1.50 P.M. P. 88; T. 103.6°. At 11.30 feet cold. Gave two grains of calomel and sugar.

6.45 P.M. P. 90; T. 102.4°. Injection not used. A large operation at 4.30.

22d. 10 A.M. P. 80; T. 99°. Ten grains quinia taken. Urine at 11.30 last night, dark green. No acid used since 10.30 A.M. yesterday. Clear again at 6 A.M. Dark specimen analyzed by Dr. Acker.¹

Two operations during the night. Bismuth; no more acid used.

6.20 P.M. P. 82; T. 101.2°.

23d. 10 A.M. P. 78; T. 101.2°. Action at 8 A.M.

6.30 P.M. P. 94; T. 101.8°. Cool at 11 A.M. One action. Bismuth in it.

24th. 10.15 A.M. P. 72; T. 99.5°. Has had 15 grains quinia. Small action at 7.

2.30 P.M. P. 90; T. 102.8°. Restless and chilly.

6.30 P.M. P. 92; T. 102°. More quiet; feels better; pain over induration, none in womb or by vaginal touch. Has complained of hot flushes, and sweats slightly.

¹ Colour, reddish-brown. Reaction, acid. Sp. grav. 1011. Chlorides, normal. Phosphates, diminished. Urea, normal. Albumen, trace. Sugar, none. Odour, none. Sulphates, normal or but slightly diminished. Sediment, small quantity, flocculent.

Microscopical Examination.—Few granular and epithelial casts. Few blood corpuscles. Epithelium from kidney, bladder, and vagina. Some leucocytes.

Here end Dr. Hagner's memoranda, taken during my absence.

25th. 20th day; 17th of fever, 10 A. M. P. 88; T. 99.6°. Desquamation not complete. Urine has to be drawn, quantity varying daily from forty to fifty ounces. Tongue clean; appetite good. Patient thinks she is improving, and expects to be up soon. She desires to see the baby, which has since its removal from the breast been kept in an adjoining room. She complains of nothing except pain upon pressing in the region of the induration before referred to. Vaginal examination discloses nothing wrong except a slight muco-purulent discharge from the os. No tenderness. The induration cannot be reached, nor can any pelvic tenderness be detected in its vicinity by the examining finger. The induration measures five inches in length and one-and-a-half inch transversely. It extends from one inch below the right superior spinous process of the ilium backward following the direction of the crest, is slightly movable, very tender, especially along the upper posterior part. It seems to begin in the region of the ilio-cæcal valve and extends upwards and backwards, and appears to be a perityphlitis. Fluctuation cannot be detected. The poultices were continued. No medicine, unless pain.

7.30 P. M. P. 92; T. 101°. Had passed a perfectly quiet day, entirely free from pain. A natural movement from bowels during afternoon.

26th. 21st day; 18th of fever, 10 A. M. P. 78; T. 98.4°.

27th. 22d day; 19th of fever, 10 A. M. P. 96; T. 97°.

8 P. M. P. 72; T. 98.2°. Induration diminished and very much less tender. Occasional twinges of pain in region of induration, occasioned by passage of flatus. The temperature at no time during the day reached the norm. Appetite good. No opiate necessary. Ordered one tablespoonful of the elixir of Calisaya three times a day.

30th. 25th day; 22d of fever, 10 A. M. Since last report patient has continued to improve. The induration has rapidly diminished, tenderness entirely gone, except upon firm pressure, and then very slight. Passes flatus frequently, but painlessly. The temperature has varied from 97.8° to 98.2°, and the pulse from 72 to 78. No stool; some distension. Appetite excellent. Strength improving. Ordered an enema to be given early next morning consisting of one ounce of olive oil and six ounces of tepid water.

Oct. 1st. Condition as noted yesterday. The enema was retained; no stool; ordered its repetition at night; and if no movement from the bowels, a dose of the following mixture to be given at an early hour the next morning, before taking any food: Sulphate of magnesia 4 drachms, aromatic sulphuric acid q. s., and water two ounces. Dose, one tablespoonful.

2d. A free evacuation of the bowels this morning. Patient feeling much better, and anxious to be allowed to sit up. In addition to usual diet, allowed corn-meal mush and milk.

11th. The patient has continued to gain strength. The bowels have acted regularly and painlessly. Bladder evacuated voluntarily for a week past. The desquamation continues. Patient sitting up. The diet has been liberal since 2d inst., consisting mainly of solids, meats, game, oysters, and eggs.

There has been no return of the lacteal secretion. The breasts are shrunken. This is an unusual result.

13th. Since last visit the baby had been fretful; to-day it was discovered that its body and limbs were covered with a scarlatinous eruption,

not intense, but sufficiently distinct to be easily recognized. The throat was reddened.

The attack ran a mild course, without any apparent subjective symptoms other than those above stated. Desquamation began on the fifth day, and was very slight. Recovery was complete.

29th. Mother and child perfectly well. There is partial return of the secretion of milk. It was discovered by the mother yesterday.

Diagnosis and Symptomatology.—The case was a typical one. The patient was a primipara. The onset occurred within the first seven days after delivery, and began with a chill near the close of the first half of the fourth day, during the day on which, in a large majority of cases, the initial chill occurs. The rapid elevation of the temperature and increased frequency of the pulse, quickly followed by the eruption of an intense exanthem with sudamina; the slight anginose affection, peculiar appearance of the tongue, quick succession of diarrhœa, and prompt commencement of desquamation are the special characteristics of the development and progress of scarlet fever in a puerperal woman. The suppression of the lacteal secretion and offensiveness of the lochia are not usual, though not exceptional. The acute suppression of urine during the night of the fifth day of the fever, escape of albumen, formation of epithelial casts, and desquamation of the epithelium of the pelvis and tubules of the kidneys are phenomena not previously observed. They may be attributed to the continuous high temperature, and increased functional activity of those organs, produced by the intensity and extent of the cutaneous inflammation. The ordinary physiological transudation must be seriously disturbed, if not wholly arrested, by a condition of heat, congestion, and inflammation which would destroy and separate the epidermis as if it had been scalded. That such congestion of the kidneys did take place seems to be demonstrated by the facts that up to the night of the fifth an excessive quantity of urine had been daily secreted, and that during the greater part of the twenty-four hours beginning at 1 P. M. of that day, that is, from 8 P. M. 13th to 10 A. M. 14th (14 hours), only eleven ounces were obtained, whereas the ten hours, including seven before and three after the period of suppression, yielded thirty-three ounces; and that after relief was obtained the secretory activity was resumed in excess. The clinical history and circumstances of the night corroborate this conclusion. The night was passed in sleeplessness, restlessness, and tossing of arms to and fro. Then also speedy restoration followed measures promptly executed, upon the earliest recognition of the dangerous complication. Total suppression of the lacteal secretion and lochial discharge, the albuminuria and urinary casts were undoubtedly due to the continuous elevated temperature. These conditions are not enumerated in the analysis of the cases cited by Olshausen. On the contrary, he states that the secretion of milk and urine, and the lochia remain undisturbed. Offensiveness but not suppression of the lochia has been occasionally observed.

At no time could septic poisoning be proved, nor was there any symptom after the appearance of the eruption which definitely indicated such absorption, though constant anxiety was felt that such a dangerous complication might be added to a condition already perilous. Septicæmia is not enumerated by Olshausen, but in a very small proportion of the reported cases other puerperal affections have occurred. In twenty-one of the one hundred and forty cases cited and analyzed by Olshausen some such malady was present; the most frequent being "a slight and usually evanescent tenderness of the uterus." Inflammatory affections of the pelvic organs are of the greatest rarity, and must be regarded as casual complications. The simultaneous total suppression of the lochia and occurrence of tympanites during the latter part of the fifth day of the exanthematous fever were suspicious symptoms. In two of McClintock's cases peritonitis appeared on the tenth and eleventh days respectively, and in one of Martin's on the eighth day. The eruption of the exanthem did not follow the ordinary rule. Most frequently it begins instantaneously with the onset and rapidly extends over the entire surface, characterized by intense redness, and soon assuming a purplish hue. In this case the difference consisted in the delay of twenty hours and gradual extension, not having covered the surface completely until the expiration of forty hours. It seemed, however, more intense, because of the destruction and peeling off of the epidermis. The diarrhœa set in early. This is always an alarming symptom. Of Olshausen's collection of cases, fifteen of the twenty-one attacked with diarrhœa died. In this case it was obstinate, but not severe. Desquamation, as is most usual in the cases of recovery, began on the seventh day. Its occurrence on the sixth or seventh day may be regarded as a favourable sign, indicating that the danger of puerperal complications has passed. With the single exception of peritonitis, and that only in three of the reported cases, no complication has appeared during and after this period.

Cause and Pathology.—No one can doubt the correctness of the diagnosis in this case, but where, when, and how she contracted the disease cannot be ascertained. I could not have communicated it, for I had not seen a case for four months, nor could I learn of any case in the city. The discharged nurse had been, by the advice of injudicious friends, brought from the neighbouring city of Alexandria, but she assured me positively that she had not seen, and did not know of a case. Sundry presents and articles of clothing for the baby had been sent to the house, some from a distance, but the poison could not be connected with them. The patient was an active woman, attended personally to her domestic affairs, and was out the day before her confinement. The analysis of the cases reported by Olshausen shows conclusively that the period of incubation may be greatly prolonged; that is, that a pregnant woman may become infected, that the poison will remain latent until labour has terminated, and that the

possibility of an outbreak lessens with the lapse of time after delivery, and ceases after the seventh day. He advances the theory that the condition of pregnancy is antagonistic to the evolution of scarlet fever, though the woman may have been infected weeks, and even months, before the day of confinement, and that the puerperal state invites, intensifies, and accelerates its evolution. In support of this hypothesis he cites the fact that only seven cases of scarlet fever in pregnant women could be found reported prior to 1876, whereas one hundred and thirty-four cases of so-called scarlatina puerperalis had been reported. These theories are based upon the conclusion that the disease is genuine scarlet fever, modified somewhat by the conditions of puerperium, but not in any manner allied to or dependent upon either pyæmia or septicæmia.

Malfatti, as early as 1780, enunciated the doctrine which Olshausen seems to have established; but Braxton Hicks¹ and others of the English school continue to maintain the view that it is a form of puerperal fever deriving its special characteristics from the scarlatinous infection. They rely upon the impossibility of tracing, in some cases, the source of the infection, the absence of severe angina, the appearance of the disease within the first few days after delivery, and the extraordinary mortality in support of the doctrine of a special form of puerperal fever. But such facts, and they must be admitted to be facts, cannot be accepted as arguments in support of such a conclusion. For the history of the many epidemics of scarlet fever, even those in which cases of scarlatina puerperalis have occurred, with the varying grades of intensity, numerous irregularities of form and type, and different percentages of mortality, and the constant occurrence of sporadic cases, in which it is impossible to ascertain the source of infection, all contradict such an hypothesis. The very fact, cited by its advocates, that the disease will reproduce in a susceptible person, whether pregnant or not, genuine scarlet fever, seems conclusive against the deduction that a lying-in woman infected with the scarlatina poison has puerperal fever. The prolongation of the stage of incubation has its analogies in the frequent continued latency of the malarial, typhoid, and typhus fever poisons. It is true that cellulitis, endometritis, peritonitis, and lymphangitis have occasionally complicated such cases, but those circumstances do not prove that scarlet fever is dependent upon such local lesions. On the contrary, cellulitis, peritonitis, and lymphangitis are not uncommon sequences of the ordinary and genuine fever as we are accustomed to see it in non-pregnant women and children. In many of the cases (Olshausen) the source of infection has been positively demonstrated. Such was the case in a number of Hicks's, some of McClintock's and Halaban's, one of Olshausen's and Clemen's, and three of Schneider's

¹ On the Relation of Puerperal Fever to the Infectious Diseases and Pyæmia. Obst. Trans. London, vol. xvii. pp. 90-174.

cases, and in many other instances, epidemics of scarlet fever prevailing at the time.

The clinical history of the case reported presents a typical picture of a case of scarlet fever. Nevertheless, the suppression of the lochia and lacteal secretion must be regarded as symptoms of either septicæmia or other puerperal complication.

Mortality.—This is very high. Forty-eight per cent. of all the reported cases died. The earlier the advent of the disease after delivery the higher the death-rate, being as high as seventy-five per cent. of those seized immediately after the labour. The character of the prevailing epidemic also exercises considerable influence.

Treatment.—Antipyresis, support and stimulation, and avoidance of purgatives, constitute the important principles of the treatment. It will be seen by reference to the clinical notes that the treatment in our case was constantly varied, but the general principles referred to were never neglected. In fact from the beginning antipyresis and support were sedulously adhered to. The patient was carefully watched, and frequently it was as important to ascertain what not to do as to know what to do. The patient did not bear quinine very well, but better when administered in solution with hydrobromic acid. Even then the deafness and buzzing noises were very annoying. It several times seemed to lower the temperature very decidedly, but it quickly rose again. The salicylate of soda exhibited a more marked, though more evanescent influence. The effect of the combination of quinine, acid, and digitalis was more durable. More positive gain was obtained from the spongings with lukewarm water, but these were administered at a late stage of the disease, when defervescence might probably have taken place. To what height the body heat would have risen if the antipyretic measures had been omitted can only be conjectured. It is not improbable it would have passed the minimum of hyperpyrexia and added greatly to the gravity of the case. The daily excursions, except on two occasions, when antipyresis had been pushed, were very short—a significant indication of danger.

Flatulence was at one time very troublesome, but was relieved either by the enema administered, the occurrence of four stools during the night of the fourth day of the fever, or by the changes in medicine and diet.

The diarrhœa was controlled by the bismuth mixture, a dose of which was given after every stool from its beginning until the consistent and partially formed stool at 1 P. M. the eighth day of the fever. Then it was suspended to be resumed either on the return of liquid, or frequently repeated movements of the bowels.

The diuresis¹ was extraordinary, especially during the seventh, eighth,

¹ Relation between the fluid absorbed and the urine excreted in scarlatina, Medical News, Oct. 27, 1883, p. 462.

and ninth days of fever. It must certainly have been due, in a measure, to the amount of liquid consumed. Thirst was considerable, and the patient frequently complained of the limited supply of fluid, notwithstanding the large quantity taken. On a former occasion I witnessed a similar instance of excessive secretion of urine, even exceeding this, occurring in a case of scarlet fever in a child aged ten years, which was followed by total suppression and alarming uræmic phenomena. The child passed through numerous sequelæ, and finally recovered after a protracted convalescence.

The apprehension of septic infection could not be dismissed after the initial chill, and several times during the progress of the exanthematic fever antiseptic intra-uterine injections were employed, more as a preventive than a curative measure. When on Sunday, the eighth day of the fever, the fever made such a rapid ascent from a previous satisfactory decline, which promised speedy convalescence, it was believed that some inflammatory complication was lighting up. I had conjectured that endometritis would follow the sudden and continued suppression of the lochia, and was not surprised to find it confirmed by the appearance of pus, and tenderness of the womb on the morning of the ninth day. It was complicated with cellulitis in the region of the rectal *ampoule*, and a perityphlitis. From this time until convalescence was established the case was complicated with a mild endometritis and an acute perityphlitis. These conditions subsided, and the case progressed rapidly to complete recovery.

It may be that the intra-uterine injections administered previous to the evening of the eighth day were unnecessary, but the fact that even so small a quantity of sanguineo-purulent fluid as was washed out on that occasion, and the larger quantity at each of the two injections on the next day, shows conclusively that the treatment was at least judicious, if not imperative, at that time. The presence of pus in the uterine cavity was not known until it was discharged by the injection, and several days might have elapsed before it would have been otherwise discovered; such delay might have proved a fatal mistake. The complete and satisfactory recovery is the best proof of the value of the antiseptic measures adopted.

ARTICLE VII.

A CASE OF ŒSOPHAGOTOMY, WITH REMARKS. By LOUIS A. LA GARDE, M.D., Captain Medical Department U. S. Army.

THE history of the case in point was made the subject of a special report to the Surgeon-General's Office last July, and it is herewith reproduced for the sake of those who may find interest in this rare operation.

G. W. Gorton, married, æt. 26, cattle-grower, came under my care May 2, 1883, at 4 P. M., at which time he was admitted to the post hospital for a foreign body lodged in the œsophagus. While masticating a piece of breakfast-bacon eight hours before admission, a vulcanite plate holding four incisor teeth, broke in two lateral halves, and in making efforts to swallow the piece of bacon, as he thought, he swallowed part of the plate. The accident was not discovered until a few minutes afterwards, when, in attempting to relieve his throat, the other part of the plate fell to the ground with the four incisor teeth attached to it. It was then learned that the plate had broken through an old fissure, which had existed in its median line since it was moulded by the dentist two years before, and that the crack had extended to one side, immediately behind the teeth, causing complete separation of the two fragments. During the eight hours intervening between the mishap and his admission to hospital, there were sharp pains experienced at the root of the neck, the voice became husky, and swallowing was painful and difficult. On examination no positive indication of the presence of an impacted foreign body could be ascertained. The two principal reasons pointing to the fact were: The history of the accident, and a sharp pain on the right side behind and above the sterno-clavicular articulation. At 5 P. M., one hour after admission, I passed a long œsophageal forceps (Bond's) to the supposed seat of impaction. The body was neither extracted nor located. This attempt was followed by fifteen similar ones with no result. The parts having become very painful and sensitive to the slightest irritation, further search was postponed, and he was advised to repair to bed, to subsist on liquids, and to keep up courage. At 8 P. M., twelve hours after the accident, he took thirty grains of ipecacuanha and frequent draughts of warm water, which brought on free emesis. Careful examination of the vomited matter proved *nil*.

May 3, 9 A. M. Found patient in good spirits. The pain on the right side of the neck had assumed a cutting character. There was a feeling of constriction on a level with the cricoid, which was aggravated by swallowing liquids. By grasping the parts behind the trachea with the thumb and index finger severe pain was produced. At 9.30 A. M., the foreign body was located eight inches down (measuring from the teeth) with a long Nélaton probe. The sound produced by a tapping motion of the probe was audible to several in the room. The patient remarked that the sound was very much intensified to his sense of hearing. A number of attempts to shift the foreign body, with the probe, in a favourable position for the forceps, showed that it was firmly impacted, and each attempt was followed by failure. The irritability of the pharynx had by this time become very great, and the patient was ordered to bed, and to subsist on liquids; indeed it was impossible for him to take food in any other than the liquid state.

4th, 9 A. M. Efforts were again made with the probe and forceps to shift and remove the foreign body, but the parts had by this time become very tender, so that each effort was followed by severe spasm of the pharyngeal muscles, fainting, and impending suffocation. It was evident to all concerned that extraction through the mouth had been faithfully tried, and that each attempt had met with stubborn failure; and further, that hope of relief from this direction must no longer be indulged. At this juncture, the patient, who had all along exhibited an undue amount of grit, commenced to show evidence of waning spirits.

At 11 A. M., the operation of œsophagotomy was decided upon. Its dangers and necessity were alike explained to the patient. The disastrous policy of delay was especially insisted on. Having been made to understand the serious danger which was hourly increasing, and the amount of suffering which must obtain if allowed to go unrelieved, he readily consented to the operation.

Operation.—Anæsthesia having been induced by ether, aided by a hypodermic injection of morphia, the operation was performed on the left side at 2.35 P. M., in the presence of Doctor L. A. E. Hodge, physician to the Cheyenne and Arapahoe Agency, Doctor C. Black of Caldwell, Kansas, who happened to be in the hospital at the time, Captain Henry Carroll, 9th U. S. cavalry, Henry Forbes, hospital steward U. S. A., and two hospital nurses. The neck having been extended, and the face turned to the right, I stood on the left of the patient looking obliquely down and across his body, and made an incision from the episternal notch to the level of the upper border of the thyroid cartilage in the space between the sterno-mastoid and the windpipe. The platysma, cervical fascia, omo-hyoid, and the outer fibres of the sterno-hyoid, and sterno-thyroid were successively cut on a grooved director. The handle of the knife was used from time to time. The carotid sheath, with its contained vessels and the sterno-mastoid, were held aside by a retractor. The windpipe and thyroid gland were similarly held and retained inward. At this point what was supposed to be the foreign body could be distinctly felt through the wall of the gullet at the bottom of the wound. The œsophageal forceps was now introduced through the mouth, and its distal end made to bulge out the œsophageal wall opposite the foreign body, the location of which corresponded to a point immediately below the cricoid cartilage. A vertical incision three-quarters of an inch in length was now made into the œsophagus, using the forceps as a guide. The incision was made on the posterior aspect of the tube as far as possible from the groove between it and the windpipe, in order to avoid wounding the recurrent laryngeal nerve, which, I may here add, was never seen during the dissection. The œsophageal forceps having been withdrawn, the foreign body was found lodged opposite the cricoid, and removed with the index finger and thumb forceps.

The hemorrhage, during the whole of the operation, which occupied nearly one hour, did not exceed three tablespoonfuls. Two superficial arterial twigs were severed in the upper part of the incision, and required ligation, and a small vein in the lower part of the cut which was controlled by pressure. One suture was employed to avoid gaping, but no formal attempt was made to close the wound. A piece of sheet lint folded upon itself was soaked in carbolic acid, $2\frac{1}{2}$ per cent., and laid on the parts.

At 8 P. M. patient complained of great thirst; allowed small pieces of ice to relieve dryness of mouth. Six ounces of pure milk were forced through the tube of the stomach-pump into the stomach. About two ounces escaped from the wound during a fit of gagging as the tube was withdrawn.

5th, 8 A. M. *Fourteen hours since the operation.* Temperature $100\frac{2}{5}^{\circ}$ F.; skin moist; slept well during the night. Six ounces of milk forced in stomach with stomach-pump.

12 M. Three ounces of milk and one-half ounce of whiskey per rectum.

2 P. M. Eight ounces of milk through stomach-pump.

3 P. M. Had a chill, and at 5 P. M. the thermometer in the axilla registered 102° F.

11 P. M. Temperature $100\frac{1}{2}^{\circ}$ F. The wound is dry. The patient believes the chill to have been due to malaria from which he suffered shortly before admission. Eight ounces of milk and two drachms of bromidia through the stomach-pump. After the tube had been withdrawn he said, "My throat is much better; I belched to-night for the first time since the operation."

6th. 8 A. M. *Thirty-eight hours since the operation.* Temperature 100° F. Wound suppurating slightly; great thirst. Mouth to be moistened with a wet cloth. The $2\frac{1}{2}$ per cent. solution of carbolic acid to be continued on the wound with a compress.

9 A. M. Eight ounces of milk and ten grains of quinine through stomach-pump followed by four ounces of cold water.

12 M. Four ounces of beef-tea, one ounce of whiskey, and ten grains of quinine per rectum.

2 45 P. M. Eight ounces of milk and five grains of quinine through stomach-pump. In attempting to force more milk into the stomach the patient became nauseated, and in hastily withdrawing the tube he vomited a mouthful of milk, some of which escaped from the wound. The suture employed to approximate the edges of the incision was removed; wound filling up fast.

5 P. M. Four ounces of milk, and one of whiskey per rectum.

11 P. M. Four ounces of water, six of milk, and two drachms of bromidia through the tube of the stomach-pump.

7th, 8 A. M. Temperature normal; wound healing fast, nutritive enemata. Fluid food to be administered through the tube of the stomach-pump at regular intervals during the day.

8th, 8 A. M. Slept very well last night. Administration of fluids through stomach-pump to be discontinued, and milk, beef-tea, and chicken-broth to be taken per vias naturales.

9 P. M. About one-third of the fluids escapes through the wound. He complains of severe pain in the back of the neck on the left side in the region of the trapezius muscle. The wound and neck to be enveloped in a large flaxseed poultice, to be changed every three hours during the night.

9th, 8 A. M. But little of the fluids escapes through the wound. The latter looks clean, and the neck is free from pain. Wound to be dressed with carbolated cosmoline.

14th. Wound granulating nicely. No escape of fluids. Patient was dressed and walked about the hospital for a short while.

18th. The patient walked to the post-trader's store to-day, a distance of seven or eight hundred yards.

19th, 9 A. M. In dressing wound this morning, observed a drop of pus and a bubble of gas escape about its middle. A probe took a direction, vertical to the long axis of the wound, toward the incision in the œsophagus, a distance of half an inch. The fistulous opening was enlarged with the probe, and packed with lint saturated in a $2\frac{1}{2}$ per cent. solution of carbolic acid. Ordered nutritive enemata, and to abstain from food by the stomach in any way whatsoever for a period of twenty-four hours. Wound to be poulticed.

20th, 9 A. M. Fistulous opening and wound irrigated with a $2\frac{1}{2}$ per cent. solution of carbolic acid. There is no accumulation of pus, as was

feared yesterday. The opening is kept patulous with a small bit of lint as before, and the poultice reapplied. To abstain from food by the stomach twenty-four hours longer, and to depend on nutritive enemata.

21st, 9 A. M. Fistulous opening apparently closed. Wound irrigated as before, and dressed with carbolated cosmoline ointment. To insure the œsophagus periods of rest, he shall observe the following directions for the next twenty-four hours: take of milk, chicken-broth, beef-tea, and water ad libitum during two hours, after which he shall take no food for a period of ten hours; he shall again take of fluids for two hours, and abstain for ten hours. Nutritive enemata from time to time.

22d, 9 A. M. Wound looks well, dressed as last noted. To take of liquids during one hour, and then to abstain for five hours, and so on in the next twenty-four hours. Allowed to walk around his room.

27th. Wound half its original size. Took boiled beef for dinner. Wound strapped.

June 12. The patient left the hospital for his home to-day, a distance of forty miles north of the post. Wound was healed with the exception of a small superficial ulcer having the area of a ten cent piece.

September 1. In a recent letter the patient informs me that the wound has healed and that he is entirely well.

The foreign body was a flat piece of vulcanite, triangular in shape, measuring 35 millimeters in length and 29 millimeters in its widest extent. It had four hooks on one side corresponding to the spaces between the teeth. It was presented to the Army Medical Museum, at Washington, D. C. The curator of the Museum, who conveys in a recent letter the thanks of the surgeon-general for the donation, states that the specimen is numbered 7421 of the surgical section.

Œsophagotomy was first performed by Goursauld, of France, in 1738, for the removal of a piece of bone one inch long and six inches in breadth. It was next done by Roland, also of France, for the extraction of a foreign body, the nature of which is not stated, in 1819. It is thus seen that a period of eighty-one years elapsed between the first and second operation. It was never attempted in England until 1833, and the first operation of which I find any note in this country was performed by D. W. Cheever, M.D., of Boston, in 1866.

The history of the operation shows that it is becoming more and more frequent, and that the results are most encouraging. From the resources at my command, I have found notes of eight operations since the publication of Dr. Cheever's monograph, in 1868, making with his twenty-one cases a total of twenty-nine œsophagotomies for the extraction of foreign bodies. Langenbeck (*Medical Times and Gazette*, vol. i., 1878) states that the operation had been performed only twenty-six times up to 1872. Of the twenty-nine cases referred to only five deaths occurred, making the mortality 17.2 per cent. When this percentage is compared with the mortality attending the temporizing measures too often employed, the value of œsophagotomy becomes at once apparent. Adelman (*Med. Times and Gazette*, June 26, 1878, p. 91) collected three hundred and fourteen cases of impacted foreign bodies which had gone unrelieved, of which

number one hundred and nine died, making, for the temporizing or "let alone" policy, a mortality of 34.7 per cent. These figures demonstrate that œsophagotomy is not resorted to as often as it should be.

The literature of the operation increases in interest as we compare the light in which it was erroneously held as regards danger by those who first performed it, with the actual results of one hundred and forty-five years. By such men as Sir William Fergusson and Nélaton, œsophagotomy was pictured as a dangerous operation. The former states (Cheever's monograph) that, "however simple œsophagotomy may appear on the dead subject, it is attended with much danger on the living, and we should proceed with great caution." Nélaton farther on is quoted as saying, "we must not conceal from ourselves the dangers inherent in this operation, which is certainly one of the gravest and most difficult in surgery." His opinion was doubtless influenced by the rather difficult operation which he advised, viz., the median. By such men as Cheever, Hamilton, Durham (in Holmes's *Surgery*), Bryant, and probably all the standard authors of our day, œsophagotomy is considered neither difficult nor dangerous in its results when performed at the proper time.

FORT RENO, I. T., Feb. 1, 1883.

ARTICLE VIII.

LUPUS AND ITS RELATION TO TUBERCULOSIS.¹ By ROBERT B. MORISON, M.D., Prof. Dermatology and Syphilis in the Baltimore Polyclinic and Post Graduate Medical School.

THE controversy over the nature of lupus has been enlivened and infused with a new interest since Koch's discovery of the tubercle bacillus. The disease is a comparatively rare one in this country, and therefore its diagnosis from diseases similar to it has frequently not been accurately differentiated. Most authorities agree that syphilis has nothing to do with its etiology, although there may be a coincident syphilitic diathesis.

It is still an open question, and at present a much mooted one, whether lupus is not a local tuberculosis. Friedländer, Volkmann, and many other authorities state decidedly that it is, while Virchow, with many others agreeing, thinks that it is not. Both parties argue from microscopical investigation, and arrive at their respective conclusions in an apparently convincing manner.

If it was possible to decide the nature of diseases with the microscope

¹ Read before the Baltimore Academy of Medicine, February 5th.

alone, leaving out their clinical study altogether, it would be a simple problem to classify them; but, unfortunately, most of the specific appearances discovered since the perfection of the microscope have been found upon further investigation to be common elsewhere. We have but to call attention to the giant cells once supposed to be peculiar to tuberculosis, and to nothing else, or to the caudated cells of cancer, formerly dominated cancer cells. These do not at the present day rank as distinctive of any diseases, but have found their place among the morbid changes occurring in many.

Without a specific something known to belong to a certain disease, the microscope does not always admit of a diagnosis. This is especially true of the skin, for the general appearances in it of almost any chronic inflammation are microscopically the same. In considering lupus and tuberculosis of the skin, this fact is not to be forgotten. Microscopically, they cannot be told apart, for even if we do not find caseation in lupus, yet it is often not found in tuberculosis. If we leave out the clinical history then, and trust merely to a microscopic examination of a case, it would be impossible to say decidedly whether it was lupus or tuberculosis.

The study of the two diseases is a curious one. The very men who consider them identical acknowledge their clinical difference, while those who consider them distinct, calling upon these clinical differences to uphold them, have in their turn to acknowledge the great microscopical similarity. Neither party is quite satisfied that the question has been definitely settled.

Koch's discovery of the tubercle bacillus is now being used as a factor in the determination of the nature of these two diseases, and it is with the idea of giving the results of my own investigations as well as those of others, that this paper has been prepared.

The influence which this relationship of lupus to tuberculosis may have upon the validity of Koch's theory cannot be denied. Are we to consider that, if the bacillus described as peculiar to tuberculosis is not found in lupus, it must be classed among the non-tuberculous diseases? On the other hand, if the bacillus is found, would it not be rational to doubt the statement that tubercle is the only disease where such a bacillus is found? In other words, in two diseases which are clinically different, but in which the same microscopical products are found, are we to consider them as one and the same, on account of this product, or should we rather consider them as distinct, and the microscopical appearances not peculiar, further than being the result, as in the case of the giant-cells of morbid change?

If, however, we accept Koch's theory without reserve, we must look upon everything as tuberculous in which the bacillus is found. By those who have investigated this subject, the acceptance of the theory has not generally been difficult. Indeed, no thorough work has been done to refute the experiments of Koch, but, on the contrary, all has tended to verify them. As the question stands at present then, and being forced

into the opinion that, until such excellent work as Koch's is disproven by as good on the other side, we must consider the etiology of tuberculosis as discovered, I should be satisfied to place lupus among the tuberculous diseases if the bacillus is found in it.

In looking over the recent literature of the subject, the difference of the results obtained microscopically is striking.

Demme¹ found in three cases of lupus a few bacilli for the most part within the giant cells. The finding of the bacilli within the giant cells of lupus would suggest the possibility of finding them in a similar position in other diseases where giant cells are numerous. That Dr. Demme is possibly wrong in his observations, however, may be supposed from investigations made by Doutrelepon.² This author was not satisfied with his results. He found a few bacilli, but not enough to prove the tuberculous character of the disease. The number of bacilli varied extremely in different cases. They were present in large quantities in a specimen taken from lupus of the right cheek of a robust female. They were found most often intercellular, but not within the giant cells. In a preparation taken from the nose, there were seen, besides the bacilli of tuberculosis, some bacilli of another species which were stained. These latter were very numerous, and partly contained within the epithelial cells themselves.

I must call especial attention to the discovery of these last-mentioned bacilli, because it has a decided bearing upon what I shall say further on regarding the care with which such investigations must be made.

Pfeiffer³ tried for some time in vain to demonstrate the tubercle bacilli in lupus taken from the conjunctiva. Being convinced that they must be present in it, he tried again, taking specimens from the conjunctiva of a girl, 11 years old, who had had the disease five years. The specimens were frozen, and coloured with fuchsin or methylene blue. In two preparations out of eight, bacilli were found; in one of these, their number was six or eight and in the other only two.

Malassez⁴ did not find any bacilli in any specimen of lupus examined by him. Inoculations of fragments into the anterior chamber of the eye of rabbits also produced no result.

Cornil and Leloir⁵ have made experiments by inoculating animals with lupus material. They insist upon the care to be observed in such experiments, and give four rules necessary to a satisfactory result: 1st, it should be certain that the animal to be inoculated is entirely free of tuberculosis; 2d, every antiseptic precaution should be taken; 3d, the

¹ Berl. klin. Wochenschrift, No. 15, 1883.

² Monatshefte für praktische Dermatologie, June, 1883.

³ Berl. klin. Wochenschrift, July, 1883.

⁴ Annales de Derm. et Syph., August, 1883.

⁵ Société de Biologie, July, 1883.

animals to be experimented upon should not be placed in infected cages or near other tuberculous animals; 4th, the lupus should be taken before it has been treated, and when it is in an active state of development.

In ten experiments made according to these rules, all were negative excepting three. They state, as a result of their microscopical search for the bacillus, that if found in lupus at all it is "*extremely rare*." In conclusion they call attention to the unsatisfactory result of their inoculations as compared to those made with true tuberculous material, and consider that lupus, if it is a local tuberculosis, is in every case a very attenuated one ("*une tuberculose très atténuée*").

A discussion arose following the report of these experiments in the Biological Society upon the question, whether, if this was the case, lupus could not be looked upon as an inoculation to prevent true tuberculosis. Cornil reported that experiments were being made to test this question, and it seemed to him possible that they might succeed.

Martin¹ does not consider the question that lupus is a local tuberculosis as settled. He maintains, however, from various experiments made by himself, that in a tuberculous subject, all the tissues of the body, no matter if they appear perfectly healthy after the most searching microscopical examination to prove the contrary, can, nevertheless, in a certain number of cases transmit tuberculous virus by inoculation. To prove this he cites many experiments, and among others the following: A fœtus was obtained a few hours after the abortion of a tuberculous woman (her tuberculous condition being proven by an autopsy several days later), which seemed perfectly healthy in all its organs, no lesion of the smallest size being found. The thorax was opened with a bistoury, heated previously red hot, and a small fragment of tissue was cut from the centre of one of the lobes of a lung. It was introduced under every antiseptic precaution into the peritoneal cavity of a Guinea-pig. Four months and a half later the animal died, and the autopsy revealed general tuberculosis. This experiment was prolonged by inoculation through four generations, with the result of producing tuberculosis in every case.

It has been shown by Cohnheim, Schüller, Heuter, Councilman, and others that non-tuberculous matter introduced into the peritoneal cavity does not produce tuberculosis. The fallacy in previous experiments, which were supposed to prove that tubercle could be produced in animals by any irritating substance introduced, lay in the fact that the animals thus experimented upon were kept in cages or laboratories teeming with tuberculous infection, and therefore their dying of tuberculosis proved nothing.

The bearing of Dr. Martin's experiments upon the subject of inoculation is evident, and they serve to convince one of the importance of casting out all chance of error before coming to any definite conclusion.

¹ Ann. de Derm. et Syph., Nov. 1883.

Demme,¹ besides finding tubercle bacilli in lupus, reports having seen them also in the exudation from ozena occurring in a young child who had been exposed to tuberculosis in the house of a man affected with the same. The child died of tubercular meningitis, and the author considered it caused by infection.

In considering the various results cited, their difference can be explained in a great measure by supposing that the mechanical manipulation of the material to be examined had not been as carefully carried out as it should have been. In my own investigations, which were made in Prague, and which range over a series of ten cases, and in those made at the same time and in the same place by Dr. Symington of New York, which comprise at least fifteen cases more, we were never able to find any tubercle bacilli. Our method of staining was based entirely upon the theory which Koch lays so much stress upon, and which is the foundation of all his tests, viz., that the tubercle bacillus has a peculiarity of its own with regard to discoloration by an acid. While acid of the strength of $33\frac{1}{3}$ per cent. will entirely wash out fuchsin or methylene blue from the tissues, and other bacilli or cocci, it does not affect the colouring of the tubercle bacillus. In the field of the microscope nothing should be stained but the bacilli. They come out distinctly in contrast to the whiteness of the rest of the field, and are then as easily distinguished as any other microscopic object. When the rest of the field is not discoloured in this manner, no dependence is to be placed upon the examination. The whole truth of the investigation depends upon a knowledge of this fact, and the non-observance of it is very probably the reason why those above quoted differ so decidedly. Dautrelepont, as before mentioned, describes other bacilli in his preparations than those of tubercle. If Koch be correct in his statement that only the tubercle bacilli remain coloured after being washed out in strong acid, then this author's preparations must have been improperly manipulated, or there would have been no bacilli in them excepting those belonging to tuberculosis. Improperly prepared specimens of almost anything, as I have found by experience, will disclose any number of bacteria.

The specimens of lupus examined by me were taken from patients of different ages, and from different parts of the body. They were all patients of Prof. Pick in Prague, and for the most part cases of long standing which had broken out afresh. Sections were made for the microscope from fresh frozen specimens, as well as from those hardened in alcohol. Ehrlich's method of staining, which I consider the best of any yet proposed, was used. After they were stained, the sections were placed in the $33\frac{1}{3}$ per cent. nitric acid, and allowed to remain in it until they looked colourless; sometimes this was as long as five minutes. The same procedure with tuberculous material always disclosed bacilli, but I was

¹ Loc. cit.

not able to find any in the lupus sections examined. The necessity of discolouring so completely was definitely impressed upon my mind by a certain specimen of sputa which was examined in the same laboratory, and which, from the want of the above precaution, was pronounced to be tuberculous, but which the post-mortem examination did not substantiate.

My first two specimens were taken from the mucous membrane of the nose of a woman distinctly marked with lupus vulgaris on the face, the disease having extended thence into the nose. Sections were made of pieces taken from each nostril, both frozen and hardened in alcohol. In none of them were bacilli found.

In the next two cases, scrapings of lupus vulgaris from a boy's leg, which were hardened in alcohol, were twice examined with a negative result.

The other six cases were from different persons, three of them being taken from the mucous membrane of the nose, where the disease was supposed to have made its latest invasion. No bacilli were found in any of the sections.

The fifteen cases examined by Dr. Symington at the same time I cannot report fully upon, but the result was the same, as no tubercle bacilli were found in any of them.

From the searching examination which all these cases were put through with by persons who were really anxious to find them, I feel quite sure that no proper tubercle bacilli, such as Koch describes, could have missed discovery. The finding of a few bacilli in a large number of sections is really a negative result, or an accident, for, if lupus is a form of tuberculosis, and if we consider the bacilli the cause of it, they should be present in such a disease as lupus where there is unmistakably an active regeneration taking place in sufficient quantities to allow of no doubt.

Reasoning upon these investigations, which are to a great extent upheld by those of others, one is forced to the conclusion that the result is negative, *i. e.*, the presence of tubercle bacilli in lupus has not been satisfactorily proven. In many minds such a result would be sufficient to prove the non-identity of the two diseases, but for those who do not believe so implicitly in the bacillus as that would require, the question is still an open one. We must refer them to the experiments made upon animals by inoculation. In these there need be no question of a bacillus as the cause of the disease. The material inoculated may contain any unknown virus, but should, whatever this may be, produce the specific disease. This lupus does not do with sufficient promptness to warrant us in classing it as tuberculous, and although Cornil suggests that it may be a kind of attenuated tuberculosis, yet the clinical fact that those affected with lupus are not necessarily exempt from tuberculosis, makes one sceptical, *à priori*, as to the success of their proposed experiments.

ARTICLE IX.

THREE CASES OF METASTATIC IRIDO-CHOROIDITIS OF ONE EYE ONLY: THIS DISEASE BEING CAUSED IN THE FIRST CASE BY ACUTE PURULENT INFLAMMATION OF THE RIGHT MIDDLE EAR; IN THE SECOND, BY CHRONIC SUPPURATION OF BOTH MIDDLE EARS; AND IN THE THIRD, BY PUERPERAL FEVER. PRESERVATION OF LIFE, WITH TOTAL LOSS OF THE EYE, IN ALL THE CASES. By CHARLES J. KIPP, M.D., of Newark, N. J.

THE first and second of the following cases, while not presenting unusual features as far as either the eye or the ear diseases are concerned, seem worthy of publication, since there are not, as far as I know, any cases on record in which this eye-disease was caused by inflammation of the ear. The third case derives its interest from the fact that the patient recovered her health—a very uncommon event in cases where suppurative irido-choroiditis follows puerperal fever.

CASE I. On the 29th of April, 1881, I saw—in consultation with Drs. Stickney and Hewlett, of Newark, N. J.—G. L., a young man, about twenty-four years of age. I learned that he had had a hard chancre about eighteen months before, and secondary lesions several months later. His present illness began about a month ago with a severe pharyngitis. A week later, his right ear, which had never before given him the slightest trouble, became very painful, and some days after this otorrhœa was noticed. The pain in and the discharge from the ear have continued since then. About a week ago the first symptoms of pleuro-pneumonia of the right side showed themselves, and the disease has since gradually advanced. Three days ago the right eye became painful and red, and the sight of this eye, which up to this time had been perfect, became very greatly impaired. Since yesterday this eye is totally blind.

On examining the right ear I found the external canal filled with pus, and after its removal a perforation was seen in the posterior half of the red and swollen drum membrane. The Eustachian tube was permeable, and on performing the Valsalvian experiment, pus and air escaped through the perforation in the drum membrane with much noise. There was no swelling or redness of the mastoid region, and pressure on this part gave no pain. He could hear the tick of my watch only when it was pressed against the auricle. The *left* ear was normal.

The examination of the eyes showed the *left* to be entirely healthy, while the *right* was blind and greatly inflamed. This eye was somewhat protruded from its socket, and its mobility was much impaired in all directions. The upper lid was much swollen and elongated, but not very red. The ocular conjunctiva was very much injected, and greatly infiltrated with serum; it overlapped the margin of the cornea, and protruded in a broad fold between the aperture of the lids. The cornea was steamy in its epithelial layer, but otherwise tolerably clear. The aqueous humour was slightly turbid. The iris was swollen and discoloured. The pupil was of medium size, irregular in shape, and at many points it was fastened to the capsule of the lens by adhesions. The anterior capsule of the lens was covered by a thin film of exudation. The vitreous body was

apparently transformed into a yellowish-white mass, which reflected so much light that in looking at the eye in ordinary daylight the observer's attention was at once attracted to it; the fundus of the eye could, of course, not be seen. The tension of the eye was greatly increased. The patient complained of great pain in the eye and the whole right half of the head.

With regard to the pleuro-pneumonia, I need only say that it presented no unusual symptoms, and that it was treated with the usual remedies.

The ear was frequently and thoroughly syringed with warm salt water, and the middle ear inflated by Politzer's method once daily. Warm poultices were applied to the eye, and the pain as much as possible relieved by anodynes.

For about a week the eye remained in about the condition described, then the anterior chamber became filled with pus, and an abscess formed in the sclerotic immediately in front of the insertion of the external rectus muscle. A few days later the abscess broke, and a large quantity of pus was discharged through this opening from the interior chamber. The pain in the eye which, up to this time, had been intense, now subsided, and the eyeball gradually became smaller. The pleuro-pneumonia slowly disappeared.

Two months after I first saw him the patient had entirely recovered his health. The eyeball was reduced to about one-half its normal size, and was free from all infection. He is now wearing an artificial eye without the slightest discomfort. The otorrhœa has ceased, the perforation in the drum membrane has closed, and the hearing of the right ear is now as acute as that of the left.

CASE II. Michael Duffy, a very robust-looking boy, ten years of age, presented himself at St. Michael's Hospital, Newark, N. J., on the fifth day of July, 1877, complaining of deafness and otorrhœa of both ears, and of sore eyes. The eye trouble was an ordinary phlyctenular conjunctivitis, which soon got well under the ordinary treatment. Vision was good in both eyes. The ear affection commenced during an attack of measles, nine years ago. He was free from pain in either ear, and could hear the tick of my watch (normal hearing distance 150 cm.), when it was firmly pressed against either ear. On both sides the external canal was uncommonly capacious and filled with very fetid pus. The walls of both canals were hyperæmic, but not swollen. Of the membrana tympani only a very narrow rim remained, and the ossicles were absent in either ear. The exposed mucous membrane of the promontory was covered with luxuriant granulation. No caries could be detected in either ear. The Eustachian tubes were permeable. He had a very bad naso-pharyngeal catarrh.

He was ordered to syringe his ears with warm salt water, and to instil a warm one-per-cent. solution of the sulphate of zinc three times daily. The granulations in the tympanic cavity were touched with a strong solution of the nitrate of silver every few days. This treatment was continued till about the first of August, when he ceased to attend. He returned, however, a week later, on account of pain in his right eye and temple. The lids of this eye were slightly œdematous, and on opening the lids a stream of hot tears gushed out of the conjunctival sac. The eyeball was in normal position, and its mobility unimpaired in any direction. There was intense circumcorneal injection, and moderate chemosis. At the inner lower margin of the cornea was situated a small phlyctenula, otherwise the cornea was perfectly clear. The aqueous was turbid, and con-

tained many grayish flakes, and at the bottom of the anterior was a small collection of pus. The iris was discoloured, but not much swollen. The pupil was of medium size, and its margin fastened to the anterior capsule by a few slender synechiæ, but, instead of being black, it was of a dirty-yellowish hue. Examined with the oblique illumination, the yellow reflex was found to be due to the dense yellowish opacity of the anterior part of the vitreous body. The lens was entirely transparent. The tension of the eye was about normal. Vision was reduced to perception of light.

The right eye was not painful, but intolerant of light. It was entirely normal in its anterior half, and the ophthalmoscope revealed only unusual fulness of the retinal veins. The sight of this eye was normal, $S \frac{2}{3}^0$.

Thinking that the inflammation of the left eye might possibly be caused by an injury, I made repeated inquiries of the boy, his family, and his playmates with regard to it, and became convinced that no violence had been done to the eye.

The boy was immediately put to bed in a darkened room, six leeches were applied to the left temple, instillation of a one-per-cent. solution of the sulphate of atropine was made every hour, and cold wet cloths were applied to the lids. Small doses of calomel and opium were administered every four hours.

Under this active treatment the boy became feverish, vomited frequently, and had much headache—symptoms which were not present when he commenced this treatment; but the progress of the irido-choroiditis was not arrested, and ended, as is usual in these cases, in atrophy of the globe. Two months later the eye looked exactly like an eye which had been lost from irido-choroiditis following cerebro-spinal meningitis. The eyeball was white, and somewhat smaller than the other; the tension was reduced; the cornea was clear; the anterior chamber was wanting; the iris was atrophic, and was in contact with the posterior surface; the pupil was small and irregular in form, numerous small masses of pigment projecting from its margin; the lens was cloudy, and a yellowish-white reflex emanated from the vitreous chamber. The eye was totally blind. The boy was again in excellent health, and his ear-disease was about the same as when he came under treatment.

Although the eye-symptoms were not precisely alike in these two cases, the disease was essentially the same in both, the difference being one of degree only. The violent inflammation, as manifested by the protrusion of the eyeball, and the great chemosis, which was present in the first case, are not at all uncommon in cases of irido-choroiditis occurring in connection with puerperal fever and other pyæmic diseases. The milder though just as destructive form noticed in the second case is most frequently observed as the result of cerebro-spinal meningitis.

Whether in these cases the irido-choroiditis resulted from emboli composed of putrid materials or septic organisms which were carried from the ear through the heart and lungs to the eye, or whether the disease was the result of an extension of the inflammation from the ear to the membranes of the brain and from them along the sheath of the optic nerve to the sub-choroidal lymph space, it is of course impossible to decide. It seems, however, most probable that in the first case both the pleuro-pneumonia

and the irido-choroiditis were caused by emboli. In the second case the irido-choroiditis may have been due to the same cause, but it is also possible that a slight meningitis was the connecting link between the ear and eye affections. It must be admitted, however, that the symptom which pointed in this direction, namely, the normal fulness of the retinal veins in the other eye, is not an unfailing one.

CASE III. *Metastatic Irido-Choroiditis of Right Eye following Child-birth; Recovery of Health.*—Mrs. B., æt. 39, multipara, gave birth to a living child in the latter part of April, 1879. The exact date cannot be ascertained, as she does not remember it, and had no physician or midwife to attend her. For two days after delivery she was in tolerable health; but on the third day she began to have pain in the lower part of the abdomen. The pain increased in severity during the following day, and at the same time she had a severe chill followed by fever and perspiration. During the next day the chills returned at irregular intervals, and the abdominal pain continued. About this time her right eye became painful and somewhat swollen, and, as far as she can remember, the sight of the eye destroyed. Some ten or twelve days after childbirth, a friend brought Dr. Zeh to see her, who pronounced the disease parametritis and pelvic peritonitis, and prescribed for her. On May 9, I saw her for the first time. She was very feeble. The pain in the bowels had subsided to a considerable extent, but the abdomen was still very sensitive to the touch. The condition of the eye was as follows: integument of upper lid slightly œdematous, but neither red nor very tense; globe somewhat protruded; mobility of globe unimpaired; ocular conjunctiva very œdematous, especially in lower half; cornea clear; anterior chamber, shallow; aqueous humour, clear; pupil, of about medium size, and bound down by numerous posterior synechiæ; iris discoloured and somewhat swollen; lens apparently cloudy; vitreous humour of a yellowish-gray hue; vision was reduced to quantity perception of light; tension considerably increased. The eye was very painful.

During the next three days the upper lid became very red, shining, and so much swollen that it could not be raised. The protrusion of the globe increased, and the eye could not be moved in any direction. The ocular conjunctiva became intensely injected and protruded in a broad fold between the lids. The cornea remained clear, but the aqueous became turbid. The pupil continued small, although a one-per-cent. solution of the sulphate of atropine had been instilled every hour. The yellowish reflex from behind the lens became more marked.

During the next two weeks the eye remained nearly in the above-described condition. On the 30th of May, the sclerotic became perforated between the insertions of the rectus externus and rectus superior. The opening rapidly increased to the size of a small pea, and gave exit to much pus. The cornea was still clear, but the anterior chamber was about one-third filled with pus. The eye was still very painful.

On the following day, a large ulcer, oblong in shape, with infiltrated margin, was observed in upper half of cornea. T—1. Patient feels much stronger, but has to-day severe pain in left knee-joint, which is red and swollen.

On the 1st of June, a circumscribed yellowish swelling (abscess) appeared between the insertions of the superior and the internal recti muscles.

By the 10th of June, the swelling of the lid had almost subsided, the corneal ulcer and the opening in the sclerotic had healed; the globe had shrunk in all dimensions, and the pain had entirely disappeared.

The left eye, which was examined daily during her stay in the hospital, showed at no time signs of disease. All symptoms of peritonitis and of disease of knee-joint having disappeared, the patient was discharged June 10.

This case differs from the vast majority of cases of metastatic irido-choroiditis following puerperal disease in this, that the patient's life was saved. According to Hirschberg (*Arch. of Ophth.*, vol. ix. p. 383), the prognosis of puerperal metastatic inflammation of the eyes is always unfavourable. All the patients that he has seen died, although, at the time of the affection of the eyes, the constitutional symptoms did not seem threatening. Death ensued in all of the cases observed by Hall and Higginbottom. The same is the case, Hirschberg thinks, in all exact observations so far reported. I can find reports of only seven cases in which the patients survived. The first of these is reported in *Mackenzie's Treatise on the Diseases of the Eye*, Am. ed. 1855, p. 574. It is as follows:—

Mr. Selkirk, Surgeon at Newtonshaw, by Alloa, informed me of the following case. A poor woman in Tillicoultry had a child, and was attended by a midwife, who had some difficulty in removing the placenta, which she brought away in pieces and at different times. Eight days after, Mr. S., being called in, found her labouring under puerperal fever, and insensible. He thought she would have died; but, contrary to expectation, she recovered. He then discovered that the left eye had, while she lay insensible, become enlarged, and that a fleshy excrescence projected between the lids. The eyeball seemed much enlarged, and felt hard, and the cornea was projecting and opaque. The poor woman had also phlegmasia dolens of the right leg.

The second case was observed by Samelsohn, and is recorded in the *Tagebl. d. Naturforscher Versammlung* in Breslau, 1874, p. 230. I have been unable to read the case in the original, but from a notice of the case in *Nagle's Jahresbericht über die Ophthalmologie für 1874*, it appears that the left eye of a multipara was attacked by metastatic choroiditis eleven days after childbirth, and that six weeks later sympathetic hyperæsthesia of the optic nerve of the right eye was developed, for the relief of which the eye first attacked was enucleated. No embolus was found in the vessels, which were either collapsed or filled with blood.

The third case is cited by Hirschberg in the *Archives of Ophthalmology*, vol. ix. page 384; it was observed by E. Martin, and reported in *Zeitsch. Geburtshilfe*, Band ix. The case was one of artificial delivery, followed by metropblebitis, metastatic choroiditis of right eye (diagnosed by v. Graefe), and gangrene of the pelvic cellular tissue; cure with unilateral blindness.

The fourth case is reported by Feuer in *Centralblatt für Augenheilkunde*, 1881, p. 35. This is a very strange case. Seven days after normal child-birth, which was not followed by fever, two abscesses developed on outer surface of the sclerotic of the left eye. There was at the time no visible disease of the interior of the eye. The abscesses perforated the sclerotic and caused panophthalmitis. The eye was destroyed, but the patient survived.

The fifth and sixth cases were observed by Mandelstamm (*Klinische Monatsblätter für Augenheilkunde*, 1881, p. 285). In one of these cases the irido-choroiditis began thirty-seven days after confinement. Although a large quantity of pus escaped from eye through perforation in sclerotic, the eye did not shrink much, and the cornea remained clear. The patient recovered her health. In the other case, a woman 27 years of age, the irido-choroiditis led to atrophy of

globe. The patient regained her health. In both cases but one eye was affected.

The seventh case is reported by Alf. Pousson in the *Archives d'Ophthalmologie*, tome i. p. 174. In this case, a woman 28 years of age had given birth to a dead child twelve days before she was seen by the reporter. In addition to the irido-choroiditis of the left eye, abscesses developed on the arm and hand. The woman recovered her health, but the eye was of course lost. Micrococci arranged in different forms, especially in the form of a rosary, were found on the eighteenth day of the disease, in the blood and in the pus, from the eye and from the abscesses of the arm and hand.

ARTICLE X.

CASE OF POISONING FROM THE BITE OF A COPPERHEAD (*Ancistrodon contortrix*, Linn.). By H. C. YARROW, M.D. (Univ. Penn.), of Washington, D. C.

THE following history of a case of poisoning from the bite of a copperhead appears to be of some value as showing how very grave the symptoms may be resulting from an injury inflicted by a comparatively small reptile:—

On May 30, 1883, the patient, a photographer by occupation, married, and aged 42 years, in fairly good health, was bitten by a small snake, not over fourteen inches long, on the tip of the middle finger of the left hand. The accident occurred one evening while he was gathering ferns from among some rocks on the left bank of the Potomac River, some distance above the Aqueduct Bridge. While scraping leaves from near the root of a fern, his finger was stung, as he thought, by a bee. Withdrawing his hand hurriedly he discovered clinging to the finger a small copperhead, which had apparently driven in the fangs so great a distance as to be unable to loosen its hold. The patient killed the serpent, but did not take it home, but from the description he gave, and from the fact that he had occasionally killed similar serpents, and knew of their venomous nature, I have no difficulty in believing that the species was *Ancistrodon contortrix*, the common copperhead, which is by no means uncommon on the Potomac above Georgetown. Nor is the case itself unusual, several similar bites having been reported from pretty much the same locality.

After the receipt of the bite the patient drank about half a pint of whiskey, which had no effect whatever upon him; he then proceeded to his home and applied aq. ammonia to the finger, occasionally dipping it in the liquid, and, upon retiring, wet a rag with the same, and wrapped up the injured member. He did not mention to his family the fact of his having been bitten, but during the night remarked to his wife that his finger felt as if he was going to have a bone felon on it. The next day, May 31st, while at work, as he still had uneasy sensations in the finger, he painted it with tinct. of iodine and dipped it in nitric acid, and in the evening applied a bread and milk poultice. The night of the 31st he felt the first sensation of pain creeping up the arm. He had headache, was feverish and nervous; his respiration was increased, and he suffered

from a general feeling of lassitude, with giddiness and nausea. He still remained without medical attendance, nor did he complain to his family of feeling these unpleasant sensations.

June 1st. His finger still pained him considerably, and his condition continued about the same with loss of appetite; his eyes were watering, and he thought the sight somewhat impaired.

2d. The arm became much inflamed on the outer aspect just above the elbow. He now consulted a physician, and told him the history of the case as has been related; but the suggestion of erysipelas was made, the opinion being expressed that the condition could hardly have resulted from the bite of a serpent.

On that evening (Saturday) he was suffering intense pain. At the close of the day's work he went to bed as soon as he reached home, and about an hour after had a chill, followed by slight fever; this was accompanied by pain on the inside of the elbow, extending up the arm to the axilla. In about half an hour a second chill occurred, which was not so severe as the first; the arm then began to swell, and was much inflamed, the pain being so intense as to keep him awake all night. The headache, giddiness, and nausea continued, with weak and watery eyes, all of the next day, which was Sunday; and Monday, as his symptoms seemed to be increasing in severity, he sent for me, this being the fifth day after the injury. His condition was then found to be, according to the record of my case-book, as follows: Face drawn and anxious; complexion clay-coloured; eyes watery; conjunctivæ injected. Tongue pale and furred; pulse small, slow, and weak, beating about sixty to the minute; temperature about normal. On the outer aspect of the elbow was a patch of inflammation nearly the size of a hand, which pained him, and was hot to the touch; the arm was swollen from a little below the elbow up to the axilla; the inflammatory patch does not resemble acute erysipelas, and the patient declares it has not the biting, burning pain characteristic of that disease. Ordered quinia sulph., five grains, every four hours; tinct. ferri chl. and aq. ammonia, āā ten drops every three hours; the whole arm to be painted with tincture of iodine. His diet was to be of the most nutritious quality, and he was to receive milk-punch twice daily.

5th. Medication has apparently produced no beneficial effect, as the swelling has extended around the arm; on the inside of the arm red lines may be seen extending to the axilla; the axillary glands are enlarged, and the patient feels very weak and miserable; no fever. Treatment continued, but a lotion of liq. plumbi subacetatis dil. with tinct. opii was substituted for the tincture of iodine as a local application.

6th. The inflammatory action is extending down the forearm towards the fingers, and up the arm towards the shoulder. Ordered quiniæ sulph. five grains, and tinct. ferri chl. twenty drops every three hours. Patient's countenance very anxious, tongue parched and furred, says he cannot sleep at night, has no appetite, and is commencing to emaciate rapidly.

7th. Dr. D. S. Lamb saw the patient in consultation with me. To-day the whole arm, forearm, and hand are twice the natural size, and of a reddish-purple colour; the skin and underlying tissues feel œdematous and boggy; there is a heavy throbbing, uncomfortable sensation, but no acute or burning pain, and the epidermis is peeling off. There are, on different parts of the limbs, large blebs filled with muddy serum. It is thought that an abscess is forming near the inside of the elbow. Were it not for

the history of snake-bite it might be supposed that the case was one of phlegmonous erysipelas.

8th. The affected limb is still more swollen, as are the hands and fingers, the bitten finger feeling to the patient as if it were asleep or numb. He is very weak this morning, almost in a condition of collapse, and suffers mentally; the pulse is very slow, weak, and compressible. The same treatment to be continued, the milk-punch to be increased, and the nourishment forced.

9th. Condition about the same; opened an abscess near the elbow, which discharged nearly a pint of thin and bloody pus. Poultice of bread and milk ordered for elbow and arm. Treatment continued, but warm water dressing substituted for the tinct. opii and liq. plumbi subacetas dil.

10th. Abscess freely discharging pus and serum. Patient feels much better to-day, has a good appetite, and wants to eat. Permission given to eat anything he has a fancy for. Pulse to-day 97, and compressible. He looks bad, and is still emaciating very rapidly. His wife informed me she had given him Dover's powder at night to make him sleep, which was forbidden, as it was feared it might derange the stomach. As some doubt had been expressed as to the diagnosis of the case, Dr. Johnson Eliot was requested to see the patient, more particularly as he had observed several cases of similar nature; he unhesitatingly pronounced the symptoms identical with those of patients bitten by copperheads, and seen by him. He advised free incisions whenever there seemed a tendency to suppuration. Dr. McConnell, the microscopist of the Army Medical Museum, visited the patient this day at my request, and prepared some specimens of his blood with a view to determine whether the corpuscles were normal.

11th. Feels pretty well to-day, but had a very bad night. Pulse 88 and weak. Swelling appears to be gradually subsiding. Some small and rather superficial abscesses are on the forearm, of which a few have opened themselves, others were opened with a bistoury. As the patient complained a good deal of buzzing in the ears, he was ordered to reduce the quiniæ sulph. to ten grains daily, the arm to be washed three or four times daily with warm water, having added to it a quantity of solution of potassa permanganate—this solution also to be sprinkled on the clothes—and poultices. The other treatment still to be continued.

12th. Is now improving greatly each day; the cavities of the abscesses on the forearm are sloughing slightly. The arm and wrist are still œdematous, but little or no pain is experienced. Dr. McConnell, who examined the blood, reports: "The blood drawn from the middle finger of the unaffected hand was, instead of the bright red of normal blood, of a brownish-red colour. On the part of the red corpuscles there was an entire absence of a disposition to form rouleaux. They were in most cases *crenated* [italic writer's], while in others, particularly where the corpuscles were massed, there was a tendency to fusion. The white corpuscles were relatively rather numerous and grouped. The examination was made with a one-twelfth homogeneous immersion Zeiss lens."

From this time, as the patient appeared to be gradually improving, no daily record of the case was kept. The treatment was mainly the same as has already been indicated, attention being paid to keeping up the strength. From time to time small abscesses formed, and were promptly incised. Towards the latter part of June, being obliged to leave town for a few days, the case was left in care of Dr. D. S. Lamb, who had seen

it with me a number of times. Upon my return he furnished me with the following notes:—

“During Dr. Yarrow’s absence, the pulse ranged from 78 to 88. Three incisions were made, two on the back of the hand, one of which was without result: the other discharged a large quantity of pus. The third incision was on the back of the arm, and was effectual. It was noticed that a general restlessness, accompanied with loss of appetite and sleep, and an indefinable distress on the part of the patient were promptly relieved by the incisions and the resulting discharge. During this time it was found necessary to administer half-grain doses of morphia at bedtime; and also to relieve constipation by an occasional aloetic pill. The quinia was diminished to five grains, and the iron to three doses daily. A daily measurement of the arm immediately below the elbow showed a steady lessening of the swelling. The quantity of discharge also diminished. He acquired during this time considerable motion of the arm and hand, which heretofore had been almost immovable.”

Upon my return I found the patient’s condition considerably improved. The pulse was strong and full, colour good, tongue clean, and he is gradually regaining flesh. The forearm, wrist, and fingers are still much swollen and purplish-red in colour; and several sloughs are discharging freely. Motion at the elbow is much restricted, but pronation and supination are fairly good, says he feels more like himself, but thinks he is getting better very slowly.

A gradual but steady improvement took place with occasional relapses, and the formation of abscesses until no less than sixteen had been opened. At the time of his discharge, in August, his general condition was excellent; he had a good colour, had commenced to regain flesh, and motion was gradually being restored at the wrist and elbow-joint. The arm was still purplish-red in colour, and swollen, but all the abscess openings had healed up under simple dressing. He mentioned a curious excess of sensitiveness in the tips of the fingers of the affected limb; everything he touched seemed to be much enlarged; for instance, when he passed his fingers through his hair it felt like coarse broom-straw. I may add that this peculiar trait remained for some time. At the present time, February, the arm is entirely normal.

I have been careful to give as detailed a history of this case as was possible, for the reason that, in looking over the literature of snake-bites in this country, I have found no record of such severe symptoms, or of any lasting so long as in the one just related. In addition to this, there are other reasons which will be manifest later on.

From a great number of cases of snake-bites reported in the medical journals of this country, I have selected a few typical examples, none of which presented, however, precisely the same train of symptoms as my own. The only case of death from copperhead bite I have been able to find chronicled is by Dr. G. A. Kunkler, in the *Cincinnati Lancet and Observer*, 1859, n. s., ii. 662.

The patient, a boy aged six years, was bitten on the right foot. When seen the foot and leg were greatly swollen, the surface of the body was cold, and there were constant rigors, pulse feeble, continuous nausea. On the following day all the symptoms were much aggravated, entire extremities had swollen enormously, the foot being a shapeless mass; vesications had formed over the entire

limb, glands were swollen, and the course of the lymphatics was indicated by red lines of inflammation; there was high fever and constant delirium; diarrhœa set in. On the third day there was but little change. Inflammation extended over the groin and scrotum, and gangrene of the foot advanced with surprising rapidity. On the fourth day the patient had a convulsion and died. The treatment was as follows: A free incision was made in the wounded part, and suction was practised by an assistant, after which a solution of ten grains of iodide of potassium in one ounce of water was injected into the surrounding tissues, a ligature having been placed around the limb in the first place. Fomentations were applied over the entire limb, opium, ammonia, infusion of serpentaria, brandy, etc. etc., were employed as indication seemed to demand. The entire limb was painted with tincture of iodine. Bibron's antidote was administered internally, but apparently without effect.

In this case the patient had seemingly received so large a charge of the poison that the vital powers were completely overwhelmed, and were unable to restrict its destructive tendency.

In the *Med. and Surg. Reporter*, Phila., 1868, xix. 259, mention is made of a copperhead bite in which the patient suffered from its effects for a period somewhat shorter than in my own case.

A male, aged twelve years, was bitten on the right index finger by a copperhead snake. A tourniquet was promptly applied to the arm above the elbow, and a strong mixture of ammonia and whiskey given every few minutes, alternating with new milk. Wound was cauterized with nitrate of silver. Patient slept none the first night from excessive pain which narcotics did not control. On the following day a line of tincture of iodine was drawn around the arm at the margin of the swelling, which now extended in dark livid patches to the axilla. The soft parts became gangrenous near the wound and sloughed; there was constant nausea, pallor of the face, and loss of appetite. Two months after the patient had recovered his finger was bent towards the palm of the hand and useless. The constitutional disturbance in this case was so great as to demand the exhibition of tonics and cod-liver oil.

In the next cases, the symptoms, although severe and even alarming, were of short duration, and the patient within a comparatively brief period had apparently recovered. The first is one in which the accident took place at Potomac Landing, Virginia, a spot which is much frequented by picnickers, and which is not far distant from the locality where my patient was bitten. The history of the case is thus given by Dr. E. M. Schaeffer, *Field and Forest*, Washington, 1875, i. 12.

Patient, a male aged twenty-one, was bitten by a snake supposed to be a copperhead, June 22, 1875, on the right hand. "The wound at once gave him some pain, like the sting of a wasp, as he described it, and in a few minutes he began to vomit. This continued until his stomach was emptied, when he still experienced violent retching. He then became deadly faint and lay down; his companions, who had not seen the snake, laughed at his statement, saying it was a bee, and took no measures to prevent absorption of the venom by sucking or bandaging; four hours later he had been brought to Georgetown, and was first seen by a physician, Drs. L. Mackall and C. H. A. Kleinschmidt having been summoned.

"Dr. Kleinschmidt described his appearance at this time to me as that of a person in the last stages of collapse, skin cold, pulse nearly gone, respiration feeble, and pupils widely dilated, with great dimness of vision. The right hand and arm were fearfully swollen, and of a grayish-black colour resembling gangrene. Stimulants were at once rejected by the stomach, but a hypodermic injection of whiskey served to rouse him. He was conveyed to his home, and the wound,

(which was on the ulnar border of the hand, midway between the palmar and dorsal surfaces) enlarged and covered with a hot poultice, cooling applications applied to the arm, and everything done that could be suggested by all previous experience in similar cases. He passed a feverish night, but was much better on Sunday. On Monday evening I called at the house, and found him nearly free from pain, though the arm was still swollen to nearly the size of a man's thigh. From this time he progressed rapidly toward recovery, and in less than a week was out with his arm in a sling."

After having been bitten the young man attacked the serpent and stamped upon it twice before it escaped. Dr. Schaeffer visited the spot where the accident occurred the following Saturday, and found a copperhead thirty-four inches long which had recently died, and which had upon it no external marks of violence. It is fair to presume that this serpent inflicted the injury, and renders the diagnosis of the species almost certain.

The skeleton of this specimen is now in the Army Medical Museum, and upon examination it was found that two of its ribs had been broken. Considering the size of the reptile, and the delay in treatment, it is surprising that more serious results did not follow.

I should not forget to mention that this case was also reported with full details by Dr. Kleinschmidt in the Tr. M. Soc., Dist. Columbia, Wash., 1875, ii. 54.

Kunkler, whose name has already been mentioned in connection with the subject under consideration, reports another case of copperhead bite in the *Med. Counsellor*, Columbus, 1855, i. 481.

Male, bitten in August, 1853, by a large copperhead whose fangs were buried deeply in the left leg, about four inches above the ankle. He disengaged the animal with some difficulty, and when it was killed it measured two feet eight inches in length. He felt only at first a strange stinging pain, and started for home at once. In a very short time, before he had reached the house, the pain was very violent, shooting up the entire limb, and he had nausea, and was extremely faint. When Dr. Kunkler saw the patient the limb was much swollen and hot; near the spot where the fangs had entered were two "large lurid pustules." The lymphatics in the knee and groin commenced to be very painful. Pulse was small, weak, and frequent; loaded tongue, great thirst, and pain around region of the wound, with great anxiety and prostration. The treatment was as follows: Wound was carefully washed with salt water, and freely excised, then cupped. The adjoining parts were also excised and cupped. A ligature was placed below the knee, and an emetic of ipecac and tartar emetic given. Copious vomiting and purging seemed to relieve the patient. A mixture of infusion of serpentaria, carbonate of ammonia, and brandy was ordered to be given every hour. The bite was cauterized with nitrate of silver, after removal of the cup, and compresses dipped in a solution of chloride of lime were placed around the whole extremity. In the evening Dover's powder was given. The next day the patient was somewhat better, but the limb was still livid and much swollen. He was put upon a tonic and supporting plan of treatment, and gradually recovered without any serious symptoms, although the wound suppurated freely. The glands remained enlarged for some time, and the extremity was very sensitive to atmospheric changes, and some months after the accident the patient had a violent attack of sciatic neuralgia.

It is surprising, in view of the size of the reptile which inflicted the injury, and the large amount of the poison which must have been received, that a recovery took place in so short a time, and with an

almost entire absence of the very grave symptoms noticed in other cases. Dr. Kunkler, who seems to have had considerable experience in the treatment of snake-bites, says: "Without proper aid such cases generally terminate fatally within from twelve to twenty hours after being bitten." He mentions also that the Indians, who are frequently bitten, seldom die, their treatment consisting in smoking the wound, washing it with urine, placing soaked tobacco leaves upon it, giving the patient an infusion of red peppers to drink, and keeping the patient in constant perspiration.

Dr. Thomas A. Elder, of Mifflinstown, Pa., reports, in the *Med. and Surg. Reporter*, Phila., 1877, xxxvii. 118, the case of a male bitten twice on the foot by a large copperhead. A ligature had been applied below the knee, but had not been effectual in preventing the spreading of the poison into the circulation, as was shown by the rapid pulse, nervous prostration, chilliness, and nausea. The sole treatment consisted in the hypodermic injection of spts. ammon. aromat., and the internal administration of the same. The limb swelled nearly to the middle of the thigh, but the man made a rapid recovery. When the swelling subsided a peculiar bruised appearance was presented by the limb. The same gentleman reports two other cases, and states that he has treated four in all by the use of ammonia, and successfully in every instance. In one of these, which occurred in 1872, the patient was bitten early in the morning on the back of the hand by a supposed copperhead. He drank a quantity of whiskey as soon as it could be procured, and visited the doctor at 5 o'clock P. M. At this time the whole arm was swollen to an enormous extent; the skin seemed hard and thick like leather; the pulse was small, weak, rapid, and irregular; breathing laboured; and he was weak and faint. Ammonia was at once used hypodermically and internally for several days, and in less than two weeks he was entirely well, with the exception of some stiffness and soreness in the muscles.

An interesting case of copperhead bite is reported by Dr. E. P. King, in *Annalist*, n. s., 1848, ii. 229, interesting because, notwithstanding the gravity of the symptoms, the patient recovered under the use of an apparently very simple remedy.

Patient, a male, was bitten in November, on the inner surface of the left hand, by a copperhead, which had been torpid, but had recovered its activity under the influence of heat. The patient excised the wounded part, and called on the doctor about twenty minutes afterwards. The wound bled freely, but a considerable areola of inflammation existed around the part. The wound was cauterized with potassa fusa, and a ligature applied about the middle of the forearm. The man was then conveyed home, suffering greatly from nervous prostration, and nerve stimulants were exhibited. The arm became swollen in the most fearful manner, the ligature appeared as if deeply buried in the integuments, but did not affect the pulse. Below the ligature it was livid with yellow spots, but above the colour was natural. Dr. King goes on to say, that finding his patient was getting worse, he happened to recollect that indigo had been recommended in poisonous snake-bites, and at once applied a solution of it to the wound, and exhibited it internally in half drachm doses. The effect was almost magical, and the man rapidly recovered after a short time.

It should be mentioned that a second ligature had been applied higher up the limb, and was kept on for an entire day, and it is barely possible that this admitted the poison in such small doses to the system that eventually its violence was destroyed. Dr. King, however, considers the indigo as a specific.

Another case of copperhead-bite is reported by Dr. L. B. Kline, *Med. and Surg. Reporter*, Phila., 1868, xix. 326, in which the patient, a girl of thirteen years, received no less than three wounds on the right instep. There was much swelling and great pain. A ligature had been applied by the family. Whiskey and ammonia were given for several days, and a poultice of wild indigo leaves applied to the part. She almost recovered in two weeks time without any untoward symptoms.

Dr. N. Harris Moragne reports a case of copperhead-bite in *South. Med. and Surg. Journal*, Augusta, 1853, n. s., ix. 81, in which the inside of the foot of the patient was bitten on the 21st of June, 1852, and in a short time he became delirious, with a hot dry skin, and a pulse ranging from 100 to 120; the left leg and ankle were enormously swollen. A ligature was applied, poultices were placed upon the wound, and olive oil and ammonia were administered internally. Notwithstanding the treatment, the patient continued very sick, until the 24th, when free perspiration took place, he became rational, the tumefaction gradually subsided, and in a short time he was entirely well.

I was informed some years ago by a Mr. Elliott, one of the early settlers of Illinois, of a case of copperhead-bite, which occurred upon his farm, and in which the dangerous symptoms showed themselves at a very early period, the patient's arm swelled frightfully, and became mottled, and delirium rapidly supervened. The only remedy administered was melted lard, of which the patient was forced to drink over a pint. He made a rapid and satisfactory recovery.

The symptoms of the bite of the moccasin, *Ancistrodon piscivorus* are very similar to those of the *A. contortrix*, but it is noticed that several authors in reporting cases speak of the great extravasation of blood which takes place in the neighborhood of the affected part. One very interesting case is reported by Dr. P. Owen, in the *New Orleans Med. and Surg. Journal*, 1867, xx. 207.

The patient, a female, was bitten Saturday, June 22, 1867, just above the right ankle, by a snake supposed to be a moccasin. When seen she was in a state of great nervous excitement, tongue coated and dry, skin cold and clammy. Affected limb was enormously swollen and mottled with extravasated blood, which mottled appearance extended in spots over the entire body, resembling a case of purpura. The limb was cold, and she suffered agonizing pain in it, which extended, as the patient declared, to the heart, and so great was the sense of constriction that she was in constant dread of death. There were hemorrhages from the skin, the nose, the mouth, the lungs, the vagina, and uterus, and at times she vomited and purged blood, also passing it in her urine. The wound had been scarified shortly after its reception, and bled freely, and whiskey, ammonia, valerian, and camphor were freely given. Sunday, June 23d, the condition of the patient was about the same, but there was retention of urine. Ammonia was stopped, and twenty drops of oil of turpentine were given every two hours. On Monday, the 24th, the pulse was 140, tongue moist, bowels moved several times, stools bloody, hemorrhages from the mouth, lungs, womb, etc. not so often or profuse as the day before. A quart of bloody urine was drawn off with a catheter. Tuesday, 25th, pulse 120; mottled spots beginning to fade on the face and neck; no hemorrhage except from nose. Urine now clear. General condition much improved. The improvement was gradual, but retention of urine continued for some time, and on July 10th, at which time she was discharged, nothing remained but stiffness, yellowness, and swelling of the leg.

In this particular case, of which the details have been fully given because of their grave interest, it is surprising that recovery took place, for in

no case reported, except one or two of rattlesnake bite, has any mention been made of the purpuragic spots and repeated hemorrhages. It may be that the patient was bitten by a rattlesnake, and did not recognize the reptile, although it would seem that its crepitation should have indicated its near proximity.

The most interesting and singular fact in connection with the bites of some poisonous reptiles is the tendency to a recurrence of certain symptoms at varying periods after a lapse of many years, and I have selected a few such cases. One is reported by Dr. Sweeney, of Rushville, Illinois, in *Cin. Lancet and Obs.*, 1860, n. s., iii. 318, as follows:—

“Mr. DeCamp, of this county, was bitten by a copperhead snake in the State of Pennsylvania, thirty years ago; he was treated at the time by his neighbours: whiskey was the only remedy used. His health, from the time of his recovery from the effects of the bite, was pretty good until 1857, about the same time of year he was bitten, when he broke the skin on the back of the hand that had been bitten so many years ago. Inflammation set in with pain, uneasiness of the stomach, delirium, and spots over the general surface the *colour of the snake*. Remedies were tried without relief. It was suggested to him by a friend, on seeing the spots on the skin, to try the ‘whiskey practice.’ By its free use he was soon relieved of the general symptoms, but still experienced slight uneasiness in the whole arm, and particularly the middle fingers of the hand, which had originally received the injection of the snake-poison, till the winter of 1858, when contraction of the fingers came on, with pain through the whole course of the arm and to the chest. The general health became bad, but has since improved. The fingers remain contracted and the whole arm much weakened.”

Three cases somewhat similar to the above are reported by Dr. Wm. Stockbridge in the *Boston Med. and. Surg. Journal*, 1843, xxix. 40.

Case 1st. Male, aged ten, bitten on the leg by a copperhead. Leg became very much swollen and painful in half an hour, with high irritative fever. There was no medical aid at hand, and the foot and leg were simply immersed in hot brine, after which a decoction of cotton wood was applied to the wound, and taken internally. The patient recovered, but the wounded part sloughed freely. For eighteen years subsequently, he has had an annual recurrence of the symptoms, attended with severe pain similar in character to that experienced when first injured, but this is unaccompanied by any swelling. It occurred precisely at the same time every year, but gradually decreased in intensity. The doctor says: “A singular circumstance relative to the location of these annual pains was, that for several years it was confined to the knee of the limb bitten; in a few years it left the knee and seized the hip, and finally it attacked the shoulder, the last time being very slight.”

Case 2d is of a female slave bitten ten years since by a moccasin (*Ancistrodon piscivorus*) who suffered from the usual symptoms of snake-bite, and every year up to the present time they have returned with greater or less intensity, but the swelling does not return.

Case 3d. A lady was bitten, and the usual symptoms followed. For twelve years she had a recurrence of painful symptoms on the bitten limb at the time of year corresponding with the time she received the wound.

In the *Virginia Clinical Record*, 1872-3, ii. 137, Dr. R. T. Coleman relates a case of snake-bite, followed in the course of a year by a scaly eruption upon the legs which resembled ichthyosis.

The patient was bitten on the right index finger by a small moccasin, and reported at once; a piece of tape was tied tightly around the finger above the bite,

and as no untoward symptoms seemed to develop, the tape was taken off in about half an hour. In less than five hours the arm had swollen to double its size, he suffered intense pain, and his pulse could be felt as a mere thread. He had whiskey administered to him from time to time until he had taken five quarts, and finally recovered, but the tip of the finger sloughed off, and he had in the following spring the eruption already alluded to. Dr. Coleman states: "This very eruption I met with once before in a man who traced it to the poison of a snake-bite, and with him it recurred a number of successive springs. This tendency to a return of both animal and vegetable poisons in the spring of successive years is a remarkable but unexplained phenomenon."

That serpents of the genus *Ancistrodon* are not the only ones whose poison seems to act in the manner related, the following case, reported in the *Med. Record*, N. Y., 1875, x. 62, by Dr. H. G. Piffard, would seem to prove:—

The patient, a female aged nineteen, had been bitten on the right thumb by a rattlesnake six years before the doctor saw her. He found an eruption of small vesicles upon the integument lying between the metacarpal bones of the thumb and index finger. She had had a similar eruption every three months. The case was lost sight of for some time, but about a year since the doctor again saw her, and was informed that for the last three or four years the vesicles had not occurred with their former regularity, and that during the last seven or eight months there had been no recurrence of the vesicles.

Dr. Piffard believes that the lesions and symptoms shown by his patient were entirely dependent upon neurotic influence, and considers the case unique, as it is with some qualification, but he states that the periodical neuralgias which are said to follow the infliction of wounds by the felinæ bear some resemblance to it. Dr. Livingston, the African explorer, mentions that a wound from a lion's tooth is generally followed by great sloughing and discharge, and pains are felt in the part periodically ever afterwards.

The case of Mr. Shindler, bitten by an elaps, or Florida harlequin snake, at the National Museum, over a year since, affords another illustration of the apparent recurrent virulence of snake-poison, for, although he made a good recovery from the injury, in a little over a year he was troubled with considerable pain in the finger which had been bitten, and a small abscess formed and went on to suppuration. It will be an interesting case to watch, and ascertain if each succeeding year he is troubled in the same manner. Just why these periodical occurrences should take place seems hard to explain. Can it be that, as in herpes, and other diseases of neurotic origin, the nervous system retains in a latent form a peculiar septic influence, which may at certain periods, under certain conditions, be awakened into temporary activity? Such a theory might account perhaps for a return of symptoms at varying periods, but cannot explain what seems to be absolute periodicity such as we have accounts of and have seen develop after serpent-bite. We know that in cases of malarial poisoning peculiar effects are produced at particular times, with great regularity, but just how these effects are produced, or why, we do not know. In the case of recurring anniversary symptoms, it would be quite

natural to suppose that the patient remembering what must have been a very painful experience a year or so before, should be in a condition of nervous hyperæsthesia to a greater or less degree, especially if gifted with a sensitive imagination; might not this have something to do with a development of symptoms? Again, at the particular time on or about the anniversary of his accident, the telluric conditions might be such as to produce neuralgic or other symptoms; and lastly we should not forget to eliminate from the well-authenticated cases such as are partly the result of an evolution from inner consciousness.

In recording the history of these cases and my own, there are certain points of interest which should be mentioned if only briefly.

In the case of the patient whose accident has given origin to this paper, nearly all of the symptoms which are generally expected to be met with in snake-bite were present, but it is rather odd that there were no local manifestations in the immediate vicinity of the injury. With the exception of a slight numbness, there was no sign of inflammation, no swelling, and at no time did suppuration occur in the finger. The venom apparently was conveyed to the neighbourhood of the elbow, and from this nidus then extended down and up the arm, producing the cellulitis which caused so much suffering and so much damage to the soft parts. Another point of interest in the case is the report of Dr. McConnell as to the appearance of the blood corpuscles under the microscope, which shows that the conclusions of Dr. Isaac Ott, of Easton, Pennsylvania, and his own are very different. Dr. McConnell visited the patient, and prepared his slides with that care for which he is celebrated, taking the blood he proposed to examine from the middle finger of the unaffected hand. He states emphatically that most of the red corpuscles were crenated, and that the white corpuscles were relatively few in number. Dr. Ott, however, in the *Virginia Medical Monthly*, February, 1883, states positively that "the blood after copperhead poisoning shows no microscopic changes of its globules, and no difference in its spectrum." Further examinations will perhaps confirm the statements of one or the other of these gentlemen.

Dr. Ott, who has made a special study of the venom of the copperhead, comes to the following conclusions:—

1. The venom of the copperhead is weaker in toxic activity than that of the rattlesnake.
2. The heart, with both kinds of venom, becomes greatly prostrated, and in rapid deaths is the main cause.
3. The venom of either snake does not affect the sensory nerves.
4. The sensory centres are affected by both venoms.
5. The muscular excitability continues to be little affected at the time of death by the poison of the copperhead.
6. The two venoms greatly resemble each other in physiological activity.
7. The cardiac force, rhythm, and frequency are lowered by both venoms.
8. The arterial tension is greatly lowered by both venoms.
9. The blood, after copperhead poisoning, shows no microscopic changes of its globules, and no difference in its spectrum.

In the main I am disposed to agree with this gentleman, except so far as the last of his conclusions is concerned, but on this point I should want additional evidence. Weir Mitchell, to whom we are indebted for most valuable researches in serpent venom, declares the blood corpuscles after venom poisoning are unaltered, although in some chronic cases he has observed a disintegration of their edges. Prof. George B. Halford, of the University of Melbourne, maintains that an enormous increase of the white corpuscles takes place after poisoning by serpent venom, and attributes the change to a germinal matter, consisting of nuclei one-four-thousandth of an inch in diameter, originating from the snake's glands. Dr. J. B. de Lacerda, of Rio Janeiro, announces that the blood of a serpent-poisoned animal presented the following phenomena: The red corpuscles began by presenting little shining points, which increased until the globule broke down, and was replaced by numerous ovoid corpuscles, very brilliant, and possessed of oscillatory movements.

Within the last few years an increased interest has been taken as to the action of reptile venom, and it may be proper in connection with the case briefly to allude to the more recent researches upon the subject, which have been carefully summarized by Dr. Robert Fletcher, of the Surgeon-General's Office, in a paper entitled "A Study of some Recent Experiments on Serpent Venom," published in the July number of the *American Journal of the Medical Sciences*, for 1883. From this paper I have extracted much valuable matter, which is included in quotation marks. In regard to Dr. Mitchell's conclusions regarding crotalus venom, he states as follows: "Venom is harmless when swallowed: 1st. Because it is incapable of passing through mucous surfaces. 2d. Because it undergoes some change in the process of digestion, which allows it to enter the blood as a harmless substance, or to escape from the intestinal canal in an equally innocent form." "The venom passes by endosmosis through serous membranes with great rapidity." A drop of venom being placed in a loop of the peritoneum, in about a minute a sudden emptying of blood corpuscles took place at the bifurcation of a capillary vessel, followed by a like occurrence at other parts. The same took place when the bared surfaces of muscles were similarly poisoned. "This action, together with the defect of coagulability of the poisoned blood, accounts for the excessive hemorrhage about fang wounds. In acute poisoning, where death rapidly ensues, the coagulability of the blood is not generally impaired, but where the symptoms are prolonged the blood after death does not coagulate." In connection with this I may mention that it was a matter of some surprise to Dr. Lamb and myself to notice, after the numerous abscesses in our patient's arm had been opened, how freely the blood flowed from the most superficial incisions.

"The cause of death in acute poisoning of warm-blooded animals is

the cessation of respiration from paralysis of the nerve centres. The heart is enfeebled, but not paralyzed. In chronic or secondary poisoning the rapid decomposition of the blood, and of the tissues locally acted upon, leaves no doubt that serpent venom is a septic or putrefacient poison of astounding energy." The experiments of Sir Joseph Fayrer, the celebrated English surgeon, who has studied with so much care the serpents of India, seem to confirm most of Dr. Mitchell's conclusions regarding the mode of action and effects of serpent venom, but in one important particular they are widely divergent. Fayrer asserts very positively that "snake-poison is deadly when applied to a mucous membrane, to the stomach, or conjunctiva." He says also that the "blood of an animal that has died from snake-poisoning is itself poisonous;" but for a discussion of the points involved the reader is referred to Dr. Fletcher's paper.

In 1879 and 1880, Dr. Lacerda, whose name has already been mentioned, resumed a series of experiments with serpent venom, commenced several years before. Injections were made into the different tissues of the body with poison from the Bothrops, and the following results obtained: "Wherever injected, unless there was vascular rupture or an antecedent wound, there were no signs of the poison having entered the blood. On the contrary, local evidences of inflammation were invariably produced, often of great intensity, such as phlegmonous abscess, meningitis, encephalitis, acute pleurisy, or pneumonia." The lung tissue seemed to be the most sensitive to the poison, and deaths followed almost as quickly as when the poison was injected into the blood. The poison was most slowly absorbed by the intestines, and the stomach seemed almost insensible to its effects.

Within a year a new reptilian venom has been investigated by Drs. S. Weir Mitchell and Edward T. Reichert—that from the salivary glands of *Heloderma suspectum*, Cope, the Gila monster of New Mexico and Arizona. These gentlemen have come to the following conclusions: "The poison of *Heloderma* causes no local injury. It arrests the heart in diastole, the organ afterwards contracting slowly; the heart loses its irritability to electric stimuli at the time it ceases to beat; the other muscles and nerves respond readily to irritants; the spinal cord has its power annihilated abruptly, and refuses to respond to the most powerful electric currents." It will be seen by this that the *Heloderma* venom acts in strong contrast to serpent venom, for the latter produces local hemorrhages, and causes death, through failure of the respiration chiefly, and does not affect the heart, unless an overwhelming charge is received, nor is there abrupt loss of spinal power.

Having gone over the work of recent investigations regarding the effects of serpent venom, it may not be deemed inappropriate to devote some space to the means and remedies to be employed in cases of snake-bite.

To most intelligent observers of such an accident, the indication would doubtless be to prevent the entrance of the poison into the general circulation by means of a ligature or bandage, which should not be narrow, but quite broad and applied above the bite, or between it and the heart, it being of course understood that these remarks, as far as ligatures are concerned, apply to wounds of limbs. The bite should then be laid open by a crucial incision, care being taken not to injure bloodvessels; and suction should be made either by the mouth (in case no abrasions exist) or by cupping; this latter procedure may be made by means of ordinary surgical cups if available, by a small tumbler or wineglass from which the air has been exhausted by burning a small quantity of alcohol or spirits therein, or by means of an ordinary wide-mouthed bottle or can in which boiling hot water should be poured and quickly emptied. Alcoholic stimulants should be given in order to keep up the flagging heart, and the band should be loosened for a few moments at a time, in order that only a small amount of the venom shall enter the circulation. This process should be repeated, and the pulse will indicate when the proper amount of stimulants has been reached. It is not necessary to produce drunkenness, as it is believed that in some cases, especially of children, death has resulted, not from the snake venom, but from lethal doses of alcohol. In view of the recent researches of Lacerda, mentioned in the able paper by my friend Dr. Fletcher, from which I have so liberally quoted, the solution of potassa permanganas should be employed as an injection in the immediate vicinity of the bite. The strength should be a one per cent. solution of the salt in water, and, as the remedy is a chemical and not a physiological antidote, it is necessary that contact with the venom should quickly take place. In a number of experiments made by Dr. Lacerda, even when serpent venom was injected into veins followed by the permanganate, the salt was an effective antidote. As to the many reputed antidotes, Weir Mitchell has clearly proved that little or no reliance can be placed on them, and although it is not decided whether the formerly much-vaunted Bibron's antidote may not have some power to check, for a time, the dangerous symptoms, he thinks further experience will be necessary to decide upon its merits. Of course, after the acute symptoms of snake-bite have subsided, others would have to be treated according to the general indications. To those interested in the subject of antidotes and remedies for serpent-bites I would suggest an examination of the very valuable and exhaustive paper by Dr. Mitchell in the *North American Medico-Chirurgical Review*, 1861, v. 262.

Some apology is perhaps necessary for the length of this paper, but it is hoped that the importance of the subject may be a sufficient excuse, and that physicians throughout the country may be induced to record not only their successful cases, but those in which medical skill has proved unavailing.

ARTICLE XI.

MYELOID TUMOUR WITH COMPLETE ABSORPTION OF THE SHAFT OF THE HUMERUS, FOLLOWING DOUBLE FRACTURE; EXCISION; DEATH. By Surgeon SHIRLEY DEAKIN, F.R.C.S. Eng., Indian Medical Department.

THE following case is one of much interest, and in some points resembles a case recorded by Norris, in *the American Journal of the Medical Sciences*, 1842, mentioned by Bryant in his *Surgery*, vol. ii. p. 532. When I first saw the patient, four months after the accident, there was no thickening of the left arm. I could distinctly make out the two fractures, fairly transverse ones, at the junctions of the middle with the upper and lower thirds of the bone. The patient was a healthy young man, rather stout. I determined to try Colles', of Dublin, method of inducing union of the fragments. This plan, according to a note by Dep. Surgeon-General Norman Chevers, I. M. D., now of the London Hospital, in his articles on fevers and tropical diseases in the *Medical Times and Gazette*, 1883, consists in putting the limb in splints and administering mercury so as to "touch the gums." I accordingly put my patient on Plummer's pill, gr. v, twice daily; after a month scarcely any constitutional symptoms had been induced, so I increased the dose; after a fortnight no improvement had taken place, and I applied a small quantity of ung. hydrarg. locally. Nothing beyond decided sponginess of the gums was induced. The upper fragment appeared to be joining, and I hoped that the treatment would be successful. The fixity was, however, probably due to the tension caused by the growth of the tumour, for, eventually, I found that the fragments were as far from union as ever.

Shortly after this, as the patient began to lose flesh, he asked me to admit him as an in-patient to the civil hospital, which he entered on the 28th of September. At this time I had not a suspicion of the growth of any tumour; the enlargement and tense, doughy feeling I attributed to œdema. The steady increase in the size of the limb and the gradual impairment of health now struck me; the mercurial treatment had been exchanged for ammonia, iodide, and bark.

The question was: What was the nature of the tumour? The youth of the patient, the oblong outline of the tumour, the absence of any bony hardness, the "semi-elastic feel, and yielding to the touch, an unequal sensation as to density," the position on the shaft of the bone, the integument covered with large full veins, suggested periosteal cancer. The absence of a bone shell, as far as could be determined by external examination, notwithstanding, from my previous experience during the past two years of three myeloid tumours, I was of opinion that the tumour was myeloid. I therefore determined to try and remove the part of the bone implicated, as I had recently successfully removed part of the radius for

myeloid disease. I was further driven to this operation by the refusal of the patient to have his arm amputated, as the movements and nutrition of his forearm were perfect. I was also anxious to save the limb.

The very free loss of blood, both during and after the operation, probably was concerned in the unfavourable result, the patient dying twenty-four hours afterwards; but the frequent vomiting and the great distension of the abdomen, and tympanites seemed to be due to some internal rupture inducing peritonitis and death from shock.

I. W. Turner, æt. 24 years; Eurasian, admitted to the Civil Hospital, Allahabad, on the 29th of September, 1883, and died from exhaustion on the 17th of November, 1883, following removal of myeloid tumour of left humerus resulting from fracture.

Present History.—On the 31st of March last, he got behind a *ticca gharry* (hackney carriage), bearing all the weight of his body on his elbows; the horse plunged forward suddenly, when he was thrown off on his left arm—the arm lying under him; he stood up immediately after and walked home, a distance of about 200 yards; he felt as though something were “rushing through the arm,” and he was unable to take off his coat when he reached home. A native doctor was sent for, and the left upper arm was put in splints for fracture of the humerus; after twenty-nine days the splints were removed, and the patient was made to use his arm by lifting light weights, after which the arm became painful and swollen, when it was again placed in splints. Three weeks after an eruption of “red blotches” appeared, scabbing over and lasting for a month; he was told it was *chicken-pox*;¹ this eruption was most marked over the injured arm, one or two blotches only appearing on the face; the arm continued swollen, but pain had diminished. Dr. Deakin examined the patient at the Colvin Dispensary on the 4th of July, 1883, when he found a fracture of the humerus in two places at the lower end of the upper third and at the upper end of the lower third. There was no union, and the ends appeared to be separated by a fluctuating mass. The patient was put under a course of mercury, producing slight pyalism; this had apparently the effect of producing union of the upper fracture. This apparent improvement only lasted for a short time, as when next examined the middle fragment was again loose.

Previous History.—Had a chancre four or five years ago; has been in good health since, excepting an attack of fever once a year. Has two brothers, both of whom are living and in good health. (One brother, who is at present a guard on the E. I. R., states that when a boy he fractured his thigh-bone in two places; the fracture united, and he has never been troubled since.)

Present Condition.—Body muscular; left upper arm swollen from about three inches below the shoulder to about two inches from the elbow; skin hot, red, and having a glazed appearance; unable to move the arm without support, the forearm and hand are unaffected. On manipulation a feeling of fluid is imparted to the touch; the site of fracture can be distinguished by free movement above and below, leaving about four inches of thickened mass in the centre; no friction discernible.

¹ Smallpox was prevalent in Allahabad at the time; it is usual, however, to call mild cases chicken-pox, according to the predilection of the patient. In my opinion the two diseases—if they are two—cannot be distinguished.

Measurements about an inch below insertion of deltoid, right 12'', left 14½''. Pulse 90, equal in both wrists; temp. 98.8° F.; appetite good, bowels open; lungs normal; heart presystolic; bruit loudest at base and over subclavians; accentuated first sound; liver and spleen not enlarged; urine, phosphates in abundance; no albumen. Treatment, cold application; rubber bandage twice daily for half an hour. Pot. iod., grs. x; infus. cinch. f 3j ter in die.

Oct. 5th. Arm much the same way; no pain except on deep pressure; sleeps well; tongue furred. B. N. O.; loss of appetite; temp. 98.8° F. right axilla; 99.2° F. left axilla. Treatment: omit pot. iod. and cold application; Ferri sulph. grs. ij; quinia sulph. gr. j; ext. aloes com. gr. ss, ter in die.—M.

Nov. 1st. The arm is gradually increasing in size; general health failing; mental depression; loss of appetite; no pain, except on pressure; unable to sit up or walk about for more than a quarter of an hour, as it causes a "tingling sensation" through the forearm; the bulk of the swelling is on the outer side of the arm, and at the site of the upper fracture; gives an obscure sense of fluctuation; the brachial pulsations can be felt conveyed through the outer and upper part of the arm; the radial pulse is good and equal to the right side; there is no loss of power in the hand or fingers; yesterday the swelling extended over the scapula and below the clavicle; this disappeared in a few hours after galvanism was applied; there has never been an increase of temperature beyond 99° F. since admission; galvanism ten minutes daily. R. Acid. hydroch. dil. ℥ xv; liq. strychnia, ℥ v; decoct. cinchona, 3j, ter in die.

14th. There is a decided increase in the size of the arm within the past three weeks; it measures 15¾''; heat and redness greater; general health breaking down; no rise in temperature; no difference in radial pulses; the patient is feeling anxious about his arm, and has passed restless nights in consequence; lungs healthy; heart, loud presystolic murmur at base and along subclavians; accentuated first sound; no evident enlargement of liver or spleen; urine, sp. gr. 1020; no albumen; no phosphates; bile present; chlorides in abundance.

16th. As the patient is falling away in health visibly, it is decided to lay the tumour open by a free incision, and remove it.

4.30 P. M. Patient placed under chloroform (Junker's inhaler); rubber bandage applied from fingers up. After the arm was tied high up at the shoulder with rubber tourniquet, the bandage was removed and a free incision was made on the outer side of the arm. The rubber tourniquet controlled the hemorrhage until the myeloid mass had been scooped out for about five inches. There was free oozing of venous blood; a firm mass of brain-like substance (large-celled myeloid tissue) welled up from the centre of the incision. I removed the whole quantity with my hands, and found that not a trace of bony tissue remained throughout the whole length of the arm beyond the epiphyses. The shaft of the humerus was wanting. There was no shortening of the limb; the rapid increase in the myeloid tissue constituting the tumour had probably prevented this. The cyst containing the myeloid substance was probably the dilated and thickened periosteum—a dense, firm membrane, with irregular striæ over its internal surface, and very vascular. There was a large amount of oozing, though there were no large vessels to tie, and a large quantity of blood, probably not less than two pints, was lost. I had no hot water, temp. 125°, of which I have the highest opinion as a styptic, ready. I plugged the cavity with

large strips of lint soaked in tr. benzoin comp.; closed the wound with wire sutures; applied splints externally, and firmly bandaged the limb up to the shoulder. Sickness occurred after the operation—in my experience a rare occurrence when the anæsthetic is administered from Dr. Junker's inhaler—and repeatedly during the night. The patient remained almost pulseless, in spite of the application of heat to the surface, and of the administration of stimulants. Blood oozed sufficiently freely to stain all the dressings through, but not beyond this. During the following day there was no improvement; the patient was quite rational, able to talk, and fairly free from pain. The abdomen became much distended during the night, and vomiting occurred at intervals until the morning. Turpentine fomentations, enemata, and alkaline draughts gave no relief, the patient still remaining almost pulseless; heart beat regular; respiration much impeded by the abdominal distension; and the patient gradually sank, and died at 4.30 P. M., twenty-four hours after the operation.

The friends refused to allow a post-mortem examination.

ALLAHABAD, INDIA, December 5, 1883.

ARTICLE XII.

THE TIME REQUIRED BY THE BLOOD FOR MAKING ONE COMPLETE CIRCUIT OF THE BODY.¹ By ROBERT MEADE SMITH, M.D., Professor of Comparative Physiology, University of Pennsylvania.

In a paper published in the *Philadelphia Medical Times* for January 26, 1884, I gave an account of a new method which I had employed to measure the amount of blood thrown out of the ventricles at each contraction, and to determine the time required by the blood for making one complete circuit of the body. I there had occasion to criticize the method which has heretofore been employed to answer this latter question, and to point out some of its defects. I have recently been studying this subject from another point of view, and have obtained some results which strengthen the position taken in the article referred to.

It will be remembered that the method which has been employed for this purpose, the infusion method of Hering (*Ztschrift. für Phys.* Bd. iii. and v., and *Arch. für phys. Heilkunde*, 1853, p. 112), consists in injecting into one jugular vein towards the heart a solution of some salt whose presence in the blood can be readily recognized by chemical tests, and in finding how soon after the injection the salt appears in the blood coming from the head in the corresponding vein on the opposite side of the neck.

When thus injected, to reach the peripheral portion of the opposite jugular vein, the salt must evidently have passed into the right heart, through the capillaries of the lungs, into the left heart, through the carotids or vertebral arteries to the head, and through the capillaries of the head

¹ Read before the College of Physicians of Philadelphia, March 5, 1884.

or face to the jugular vein; or, in other words, must have passed through two capillary networks with their arteries and veins. It must, therefore, have completed an entire circulatory revolution. But to conclude that the time elapsing after the introduction of the salt into one jugular vein before it is found in the blood coming from the head in the opposite vein is the time required for one molecule of blood to pass from one of these points to the other, it must in the first place be admitted that the salt has been carried mechanically by the blood, without diffusing through it, with the same velocity as the blood itself; and in the second place to enable the formation of any opinion as to how often the entire mass of blood passes through the heart, it must be admitted that the velocity thus determined by the infusion method is the mean velocity of the blood mass. To show that both of these assumptions are unwarrantable is the object of the present communication.

I. *The Element of Diffusion in Hering's Method.*—Poisseuille (*Ann. d. Sciences Nat.*, 1843, ii. ser. t. xix. p. 30) was the first, and as far as I know has been the only one to offer any experimental proof as to the falsity of the belief that the potassium salt was carried mechanically, as would be an inert body, by the blood. He repeated Hering's experiments on the horse, and was able to confirm his statement as to the time elapsing after the injection of the solution of potassium ferrocyanide before it appeared in the jugular vein of the opposite side; but he further found that this time was different for different substances, and was even modified by the presence of other substances when injected with the potassium ferrocyanide. Thus, while the time required for the circulation of the potassium ferrocyanide was *twenty-eight* seconds in the horse, when a little alcohol, in quantity insufficient to have any appreciable effect on the pulse and blood pressure as measured with the hæmadynamometer, was injected with the potash salt, the time of circulation was lengthened to *forty-five* seconds. Or, when potassium nitrate or ammonium acetate was administered under similar circumstances, the duration of circulation was reduced to *eighteen* or *twenty* seconds. In other words, he found that in the living body the rapidity of circulation of substances mixed with the blood agreed with the rapidity of flow of the same substances through dead capillaries or even through glass tubes.

It is, moreover, well known that if two fluids capable of mixing are brought into contact they will diffuse into each other with a considerable degree of rapidity, even when the mass of the liquid is at rest or when there is great difference in the relative volumes of the fluids; while if one fluid is poured into another with which it is miscible, or if agitated after the two fluids are brought into contact, diffusion is almost instantaneous. And as some force is always employed in injecting the salt solution into the vein, the mixture of this solution with the blood will be promoted,

while the motion of the blood renders the conditions still more favourable for diffusion.

The assumption is, therefore, a fair one, until subjected to experimental disproof, that the element of diffusion forms a considerable item in the rapidity with which solutions of salts complete the circuit of the body. As far as I know, however, no such proof has ever been advanced, and the direct experiments which I have made on this subject serve rather to confirm than to disprove this assumption.

It is evident that if any particular, inert substance, small enough to pass through the capillary networks, and capable of ready recognition, could be injected into the blood, there could be no question as to the element of diffusion in the time required for such a substance to complete the circuit of the body; its velocity of movement must be the velocity of the current in which it moves; and if more time is required for the circulation of such a body than for the salt solution, it will be evident that some force other than the propulsion of the blood is concerned in the movement of the salt. These conditions I believe to be filled in employing pigeon's blood as the body whose transit is measured.

The red blood corpuscles of the pigeon have a short diameter smaller than the diameter of mammalian blood disks; and as all red blood corpuscles pass edgewise, and oval corpuscles (as in the frog) pass endwise in the centre of the blood stream, it is probable that the pigeon's corpuscles will circulate in mammalian bloodvessels with their long diameter in the axis of most rapid movement. They therefore agree with the first requisite as to size.

In the second place, they are oval and nucleated, and so form such a strong contrast to mammalian blood disks that a single pigeon's corpuscle in a drop of mammalian blood can be found under the microscope with the greatest readiness.

It might at first seem, however, that pigeon's blood injected into the vessels of a mammal is by no means an inert substance. It was proved in the earlier operations of transfusion that the blood of one species of animal is a direct poison for other species. When the blood, whether defibrinated or not, of one group of mammals is injected into the vessels of another of the same class but of different species, the corpuscles of the injected blood rapidly disappear, the plasma becoming red from the liberated hæmoglobin, which, when large quantities of blood are injected, may pass off through the kidneys, causing hæmoglobinuria, or even into the mucous and serous secretions; while at the same time the corpuscles of the animal receiving the injection, if they are themselves soluble in the injected blood, break down, and as a consequence convulsions and death through asphyxia may result.

The resistance offered to these phenomena differs in different groups of

animals; thus, the dog, of all animals, is least liable to dangerous symptoms following the injection of blood from a different species. There is still another complication to be noted. Before the corpuscles are dissolved they tend to run together into heaps and so cause emboli, while again the liberation of hæmoglobin is likely to cause thrombosis.

It would seem from the above that pigeon's blood, which was also found by Bischoff to provoke analogous symptoms when injected into mammals, is by no means an inert substance, and is therefore entirely unfitted for the use I have made of it. Such is not, however, the case. The production of the symptoms mentioned above is a question of minutes; the duration of the circulation one of seconds; and I have found by direct experiment, as will be shown later, that the circulation is completed before disorganization commences.

There is one difficulty, however, that must be guarded against. The solution of the pigeon's corpuscles occurs not only in the vessels of the dog, the animal on which most of my experiments were made, but also after blood has been drawn and exposed to the air. Therefore, if the corpuscles are not sought for within a very short time after the withdrawal of the blood, they will only be found with great difficulty, and sometimes not at all, though it may be that their presence in the same portion of blood was proved only a few minutes before. To avoid error from this cause Dr. Gray, the Assistant Demonstrator of Histology in the University, kindly examined the blood for me the instant that the collection was made and before alteration had commenced. Such a procedure is not, however, absolutely necessary, as the first change in the corpuscles is their loss of hæmoglobin and consequent transparency, while the cell wall disappears still later, and the nucleus remains unchanged for some time. If, therefore, a little aniline red is added to the drop of blood under examination, pigeon's corpuscles, otherwise almost invisible, can be readily recognized.

Method of Experiment.—Two pigeons were killed by decapitation immediately before the experiment, and their blood collected in a dry porcelain dish and thoroughly defibrinated by whipping with glass rods; the blood was then filtered through a fine linen cloth moistened with half-per-cent. salt solution (water was avoided so as to preserve the corpuscles unaltered).

The animal to be experimented on was then tied and etherized, and glass canulæ, of the same calibre as the vessels, were inserted into the external jugular veins, in the left directed towards the heart, and in the right towards the periphery, flow of blood being prevented by spring clips. A canula was then inserted into the femoral artery and connected with a mercurial manometer writing on the kymographion.

The canula in the right external jugular vein was connected by means

of a piece of rubber tubing about 4 centimetres long with a glass stopcock by which the outflow of blood could be regulated to about the amount normally passing through the vein.

The apparatus for collecting the blood and for noting the time of each collection consisted of a horizontal glass disk 31 centimetres in diameter, which could be uniformly rotated by clock-work at any desired speed. Twenty-four watch-glasses, each about 2 cm. in diameter, were fastened by sealing-wax around the edge of the disk, and the apparatus was so arranged that as the disk rotated the centre of each watch-glass passed under the stopcock connected with the right jugular vein.

The time was recorded in the following way: The entire disk, with the exception of the border on which the glasses were fastened, was covered with a layer of lampblack, and an electro-magnetic lever so arranged that as the disk revolved it would describe a concentric circle on the smoked surface. This electro-magnet, with a similar lever writing on the drum of the kymographion, was included in an electric circuit broken every second by a second's pendulum. Each interruption of the circuit, therefore, made a mark simultaneously on the revolving disk and on the moving paper of the kymographion. The apparatus was further so arranged that a single movement started the revolving disk and at the same time made a mark on the already revolving drum of the kymographion. The orifice of outflow from the stopcock and the time lever were on the same radius of the disk.

A syringe containing 10 c. c. was then filled with the defibrinated pigeon's blood and bound in the canula, previously filled with the same blood, in the left external jugular. After all connections were made the kymographion was started and allowed to revolve for twenty or thirty seconds before making the injection, so as to get a normal pulse and pressure curve. The clip was then removed from the right jugular vein, and as soon as the blood commenced to flow from the glass stopcock, the clip was removed from the left jugular, the injection made, and the disk started simultaneously; the instant of starting the disk being also automatically recorded below the pulse line on the kymographion.

When all the cups were filled with blood the disk was stopped and the blood instantly examined microscopically for the presence of pigeon's corpuscles. When it was determined in which glass they first appeared, it was only necessary to count the number of breaks in the time line on the disk from this glass to the start to determine how many seconds were required for the pigeon's corpuscles to pass from the left jugular vein to the right. While by laying off on the kymographion tracing the same number of seconds from the starting of the disk, the number of pulsations in that period was readily determined, and also whether the injection produced any disturbance of circulation.

The following are the details of two experiments made on this plan:—

Experiment I.—Nov. 24, 1883. Dog. Weight 18 kilo. Experiment conducted as described above; effects of ether had largely passed off before the experiment was made. Time required for pigeon's corpuscle to pass from the left to the right jugular 20 seconds. Pulse in 20 seconds = 55.

Before Injection.

Blood pressure.	Pulse in 15 seconds.	Respiration in 15 seconds.
160 mm.	36	6

After Injection.

5 seconds, 160	“		
10	“	155	“
15	“	148	“
20	“	135	“
30	“	90	“
45	“	70	“
39 in first	15 seconds.		6
43 in second	15	“	6
38 in third	15	“	7

The experiment was then interrupted for half an hour, when the low pressure produced by the pigeon's blood had passed off. 1 gram. of potassium ferrocyanide was then dissolved in 10 c. c. of normal salt solution, warmed to 38° C., and then injected into the left jugular vein, and the blood collected from the right jugular, and other details followed, as in the case of the injection of pigeon's blood.

Before Injection.

Blood pressure.	Pulse in 15 seconds.	Respiration in 15 seconds.
155	40	7

After Injection.

5 seconds, 110			
10	“	50	
15	“	30	
20	“	20	
30	“	18	
16 in first	15 seconds.		1
6 in second	15	“	none.

Dead.

The blood was then allowed to stand in the watch-glasses until the serum separated; a drop of the latter was then drawn off with a pipette, placed on a porcelain dish, acidulated with dilute hydrochloric acid, and tested with a drop of dilute ferric chloride solution. It was then found that the portion of blood collected *fifteen* seconds after the injection of the potassium salt was the first to form the characteristic blue with the iron. The potassium ferrocyanide, therefore, passed from the left jugular vein to the right in *fifteen* seconds; pulse in 15 seconds = 16.

Experiment II.—Nov. 30, 1883. Dog. Weight 10 kilo. Details of experiment the same as in the preceding. The pigeon's corpuscles were found in 17 seconds; pulse in 17 seconds = 53.

Before Injection.

Blood pressure.	Pulse in 15 seconds.	Respiration in 15 seconds.
120	33	5

After Injection.

5 seconds, 120			
10	“	120	
15	“	120	
20	“	120	
30	“	115	
60	“	60	
44 in first	15 seconds.		6
50 in second	15	“	7

The animal was then allowed to remain undisturbed until the pressure again became normal, when 0.4 gram. potassium ferrocyanide, dissolved in 4 c. c. normal salt solution, was injected, and the blood collected as before.

Before Injection.

Blood pressure.	Pulse in 15 seconds.	Respiration in 15 seconds.
150	36	6

After Injection.

5 seconds, 120			
10 " 55			
15 " 25	18 in first	15 seconds.	2
30 " 15	15 in second	15 "	none.

Heart stopped one minute after injection.

The serum was then tested as in the previous case, and the Prussian blue found in the blood collected $9\frac{1}{2}$ seconds after the injection of the potassium salt. The heart-beats in this period = 14.

The comparison of the times required in the same animal for the circulation of the pigeon's blood and the potassium salt clearly proves the falsity of the assumption that the salt moves through the vessels with the same velocity as the blood.

Vierordt (*Stromgeschwindigkeiten des Blutes*, Berlin, 1862), who, by his numerous experiments and important modifications and extensions of the plan of research, has identified himself with Hering's method, from a series of seventeen experiments made on dogs with an average body weight of 9.14 kilo. places the mean time of circulation in the dog at 15.22," and from experiments made on three rabbits of 1.37 kilo. average weight he gives 6.91" as the mean time of circulation. In giving these figures he states that he has been careful to exclude all experiments in which the violent symptoms produced by the injection of the poison occurred within the time that his other experiments made on the same plan, but in which such symptoms did not appear, give as the mean time of circulation. This is, however, manifestly unwarrantable; for, were the substance injected a solid carried mechanically by the blood, any disturbance of circulation accompanied by great reduction in the pulse and blood pressure could only produce reduced velocity of the circulation, and consequently prolong the time required for the circuit of the injected solid around the bloodvessel system. But that in the face of such disturbance, and that, too, of the most violent character, the salt could be distributed with the greatest rapidity throughout the body clearly proves that it was not mechanically carried by the blood. Thus, in the experiments detailed above, we find that even when given in doses large enough to arrest the heart almost instantly, thus removing the main cause of the movement of the blood, and greatly reducing its velocity, we find, nevertheless, that the potash salt circulates more quickly even than the time given by Vierordt, and twenty-five per cent. faster than the pigeon's corpuscles are carried by the blood under normal conditions of pulse and pressure; for it should be noticed that the pulse and pressure remain comparatively undisturbed until after the circulation is complete. That the pigeon's cells are not delayed in their passage through the capillaries is proved by the fact that there is never any rise of blood pressure after making an injection of

pigeon's blood, as would occur were there any blocking of the circulation in the capillaries.

The following are the results obtained in ten experiments made in the manner described above to determine the time required for the passage of the pigeon's corpuscles from one jugular vein to the other. In each case the pulse and pressure remained undisturbed until after the circuit was completed.

No.	Animal.	Time of circulation.	Pulse in time of circulation.	Weight.
1.	Dog	20 seconds.	55	18 kilo.
2.	"	17 "	53	10 "
3.	"	15 "	50	8 "
4.	"	15 "	47	8 "
5.	"	18 "	44	10 "
6.	Pup	20 "	60	3 "
Averages		17.5 "	51.5	9.5 kilo.
1.	Rabbit	14 "		
2.	"	12 "	—	3 "
3.	"	9 "	27	1½ "
4.	"	9 "	35	2½ "
Averages		11 "	31	2.3 "

It is seen, in the above series of experiments made on dogs with about the same average weight as those experimented on by Vierordt (9.41 kilo., and 9.5 kilo.), that the mean time required by the pigeon's corpuscles for the jugular circuit is 17.5'', as compared with 15.22'' obtained by Vierordt for the potassium salt; while in the rabbit 11'' was obtained as a mean as compared with 6.9''. Consequently, in the dog nearly 15 per cent. of the time stated by Vierordt as expressing the mean time, and in the rabbit over 59 per cent., are due to diffusion.

In this connection it might be suggested that the rapidity of circulation is greater in small animals than in large, not only on account of the shorter path to be traversed, as insisted upon by Vierordt, but because small animals contain, both absolutely and relatively as to body-weight, a smaller volume of blood; and since it has been shown that diffusion has something to do with the result, the salt will diffuse more rapidly into a small volume of fluid than into a large; therefore the element of diffusion is more marked in the rabbit than in the dog.

II. *The Value of the Infusion Method in Determining the Mean Time of Circulation.*—It may at the outset be admitted, with Hering and Vierordt, that the mean velocity of the circulation, if it could be determined for the jugular path, would probably express the mean time required for the total amount of blood to complete the circuit of the body. For while the portion of the blood which leaves the aorta to pass through the coronary arteries to reach the right auricle follows a shorter path than the blood which passes through the capillaries of the feet or the portal system, the velocity in the large trunks is so extremely high that the difference in

time in passing through two large trunks, even of such extremes of length as the carotid at its origin and the metatarsal, is so slight as scarcely to be appreciated. The great part of the time of the circulation is therefore consumed in passing through the capillaries, and the jugular path may be regarded as giving a mean between the two extremes of distance above alluded to. It therefore only remains to determine whether the mean time required for the jugular circuit has been or can be obtained by the infusion method, or by the modification which I have employed.

It has already been shown that the elements of diffusion in this method cannot be neglected, since, even after stoppage of the heart, when the only remaining propelling force acting on the blood is the rapidly decreasing difference in pressure between the arterial and venous systems, the potassium salt is carried around the circuit even in less time than is stated by Vierordt to be the mean normal time of circulation, and in considerably shorter time than is required for the pigeon's corpuscles. But even this time required for the circulation of the pigeon's corpuscles is far above what must be the true mean time. For we know that in all cases of movement of fluids in tubes the portion of the fluid in the centre of the tube moves with a much higher velocity than the portions in contact with the walls of the tube. It is also known that the red blood corpuscles, from their greater specific gravity, are carried in this central column of greatest velocity, and, *a fortiori*, pigeon's corpuscles, having a greater specific gravity than non-nucleated mammalian cells, will have the maximum velocity of the moving column. Consequently, the time required for the circuit of the pigeon's corpuscles will be much shorter than that required for the mass of the blood.

An experiment of Schiklawsky (Hermann, *Handbuch der Physiologie*, vol. iv. p. 315) suggested to me a means by which the minimum velocity of the blood could be obtained. He found, when particles of different densities suspended in a fluid were propelled through capillary tubes, that the particles with the greatest density moved with the highest velocity, while the lighter particles moved in the peripheral portions of the stream where the velocity was the lowest. This fact serves to explain the motion of the red blood cells in the axis stream, while the lighter white blood corpuscles move along the walls of the vessels. If, therefore, a fluid containing suspended particles lighter than the red blood disks, and small enough to pass through the capillaries, is injected into the blood current, it may be assumed that the lighter particles will be thrown out of the more rapidly moving central current into the slower moving excentric layers.

The following experiment seems to indicate that this is actually the case:—

About 1 gram of carmine was rubbed up in a mortar with 30 c. c. of normal salt solution, poured into a conical glass vessel and allowed to stand for twenty-four hours; by this time all the larger carmine par-

ticles had settled to the bottom of the glass, and the upper layers, as proved by microscopic examination, contained only carmine granules, of which the largest were smaller than the mammalian red blood cells. This was determined by placing a drop of the carmine fluid with a drop of blood on a slide under the microscope. 10 c. c. of this fluid were then injected into the external jugular vein of a dog, and the time which elapsed before the carmine particles appeared in the blood drawn from the opposite jugular vein was determined in the same manner as was made use of in the experiments with the pigeon's blood.

The following are the details of the experiment:—

Experiment XI.—Dog. Weight 10 kilo.

<i>Before Injection.</i>			
Pulse in 15 seconds.	Pressure.		Remarks.
35	110		
<i>After Injection of 10 c. c. of Carmine Fluid.</i>			
36 in first 15 seconds.	110		Carmine granules found in blood drawn
36 in second 15 "	115		from opposite jugular in 35 seconds
37 in third 15 "	118		after injection. Pulse in 35 seconds
			= 85.

Without laying too much stress on this single experiment, it is at any rate probable that a mean between this extreme and the maximum velocity shown by the pigeon's corpuscles will give the mean time of the circulation. Consequently, I would place the average time required to complete the circulation in a dog of 10 kilo. weight as between 25 and 30 seconds. It will be seen that this statement can be confirmed by another line of argument.

If the amount of blood driven out of the left ventricle was a constant quantity, the rapidity of the circulation would be in direct ratio to the number of pulsations of that organ. But as we know that the amount of blood thrown out of the heart at each contraction is subject to great variability, and as I have shown in the paper before alluded to, that this amount falls considerably below the estimate of the ventricular capacity made post-mortem, the attempt of Vierordt to formulate a law as to a definite relation between the duration of the circulation and the number of ventricular systoles which would agree with the numbers obtained by him as expressing the time of the circulation is not warranted by the facts in the case.

Thus, Vierordt stated that in all species of animals the time required for the completion of the circulation was the time required by the heart for making *twenty-seven* pulsations; consequently, each ventricular contraction must discharge $\frac{1}{27}$ of the entire bulk of blood in the body.

Now, according to the calculations of Heidenhain, which are generally accepted as correct, the average amount of blood in a dog is $\frac{1}{3}$ of his body's weight. A dog weighing 10 kilo. will, therefore, contain 769 grams of blood; or, as the specific gravity of blood is about 1050, 730 c. c. of blood. To propel this volume of blood once around the body in twenty-

seven pulsations of the heart, at each contraction the ventricle must discharge 27 c. c. of blood, a quantity which is about double the amount which the ventricle of a dog weighing 10 kilo. can be made to contain.

There can be no doubt, however, though the statements of Vierordt in this connection are incorrect, that there must be a definite relation between the number of heart-beats and the time of circulation; for the application of the same line of argument to the data I have obtained gives a result which almost absolutely coincides with the figures obtained by direct measurement. In a dog weighing about 10 kilo., about 12 c. c. would be thrown out of the ventricle at each contraction under normal respiration; and as the amount of blood in the body would in a dog of this size be 730 c. c., sixty pulsations of the heart would be required to drive the entire amount once around the body. Placing the pulse-rate at 120 in the minute, the circulation would be completed in 30 seconds, a number which is identical with the figures given above.

It also appears that the number thus obtained by deduction as giving the number of heart-beats to complete the mean circulation is nearly in accordance with the number of pulsations required for the circulation of the pigeon's corpuscle; for if 50 pulsations are required for the maximum velocity and 85 for the minimum, the mean between these, 67, is near enough to the figure obtained by deduction to show that the method is nearly absolutely correct.

While there can be no doubt that an abnormal increase in the rate of the pulse, by diminishing the amount of blood thrown out of the ventricle, will lengthen the time required by the blood to complete the circuit of the body, it cannot be urged that in my series of experiments the pulse was sufficiently accelerated by the ether to cause any retardation of the circulation. For in Experiment I., where the effect of the ether had passed off before the estimate was made, the time of circulation was even longer than in cases in which the narcosis was more profound.

There is one other point in which my experiments fail to confirm the results obtained by Vierordt. Although I cannot find in his paper before referred to any experiments to substantiate the assertion, he makes the statement (*Grundriss der Physiologie des Menschen*, 5th Auflage, 1877, S. 162) that moderate stimulation of the vagi lengthens the time of circulation by reducing the number of pulsations of the heart, but that nevertheless 26 contractions are here also required to complete the circuit; from which he makes the deduction that moderate irritation of the vagus reduces the number of the heart's contractions without modifying the amount of blood thrown out at each systole.

Of course, since I have not seen the details of the experiments on which these conclusions are based, it is impossible to form any opinion as to what is meant by "moderate" stimulation of the vagus.

As far as I know, no measurements of the quantity of blood thrown out from the heart during vagus irritation have ever been made, though a

diminution of pulse rate by cold has been found by Howell and Donaldson (*Proc. Roy. Soc.*, No. 226, 1883) to augment the quantity of blood discharged at each systole. And if the irritation were not sufficiently severe to cause much reduction in blood pressure or velocity it is conceivable that the pulse might be considerably reduced in frequency, but that the reduction would be balanced by the larger volume of blood discharged at each contraction. The only difference, therefore, in the phenomena of circulation during vagus irritation from the normal condition would be that fewer heart beats would be required to complete the circulation. The following experiments show this to be the case:—

Experiment XII.—Dec. 18, 1883. Dog. Weight 11 kilo. Pigeon's blood injected, and time of circulation estimated as before. Irritation of vagus with induction current commenced at moment of injection.

Before Injection.

Pressure.	Pulse in 15 seconds.	Respiration.	Remarks.
180 mm.	37	5	

After Injection and Vagus Irritation.

140	“	16 in first 15 seconds.	Vagus irritated 31 seconds.
150	“	20 in second 15 “	Corpuscle found in 19
140	“	32 in third 15 “	seconds. Pulse in 19
120	“	48 in fourth 15 “	seconds = 21; normal pulse in 19 seconds = 50.

Experiment XIII.—Dec. 20, 1883. Dog. Weight 14 kilo. Conditions of experiment the same as in preceding.

Before Injection.

Pressure.	Pulse in 15 seconds.	Respiration.	Remarks.
160	35	7	

After Injection and Irritation.

140	18 in first 15 seconds.	Vagus irritated 44 seconds.
160	24 in second 15 “	Corpuscle found in 14 seconds.
130	30 in third 15 “	Pulse in 14 seconds = 17. Normal pulse in 15 seconds = 35.
90	47 in fourth 15 “	

UNIVERSITY OF PENNSYLVANIA,
February, 1884.

ARTICLE XIII.

MULTIPLE GUNSHOT WOUNDS, WITH CONSEQUENTIAL REFLEX PHENOMENA ON THE PART OF THE EYE, HEART, AND LEG. By D. S. LAMB, A.M., M.D., Army Medical Museum, and SWAN M. BURNETT, M.D., Professor of Clinical Ophthalmology and Otology in the University of Georgetown, and Ophthalmic and Aural Surgeon to the Central Dispensary and Emergency Hospital, Washington.

In the third surgical volume of the *Medical and Surgical History of the War*, page 748, is the report of a case (Case 1090) of reflex paralysis in consequence of, but occurring twenty years after, a gunshot wound.

The history there given is now somewhat revised, amplified, and brought down to date nearly a year and a half later.

August 7, 1862, Sergeant C. A. Norton, 1st Maine Cavalry, age 22, while on special detail with a small party near Culpepper C. H., Va., and dismounted at the time, was shot by a guerilla who was hiding in a cellar. The soldier received three flesh wounds from as many leaden slugs; one just above the inner side of the right knee; a second just above the flexure of the right elbow; and the third over the upper anterior part of the left side of the chest, near the shoulder. He cut out with his pocket-knife the missile in his thigh; the other two remained imbedded. The wounds of the extremities were slight, and gave but little pain; in twenty days they had healed. The wound of the chest, however, was deeper; the slug entering just over the left third rib, nearly in a line perpendicular to the middle of the clavicle, and passing upwards and backwards, lodging in the deep muscles.

As soon as wounded, he fell forward unable to speak, though retaining consciousness; his mind was unusually active, and incidents long forgotten passed rapidly in review before him. At first the pain in the chest was sharp and tingling, accompanied by a beating throbbing sound in the left ear, and great sensitiveness of the eyes to light. All of these symptoms gradually disappeared, and in two months he rejoined his command. Within a year, however, his eyesight had so far failed that he was compelled to use positive glasses when reading; even then, the left eye was nearly useless; he had, also, frequent attacks of neuralgia of the heart. These ocular and cardiac troubles remained unchanged for twenty years. Although the wound of the chest did not give him inconvenience, he could at any time, by simply striking the heel of the left foot smartly on the ground, produce a numbness of the entire left side, including the arm and head.

In the mean time, in December, 1864, he was transferred to the 7th New Hampshire Infantry; and in the land attack on Fort Fisher, January 15, 1865, he was again wounded. A carbine bullet entered the palm of the right hand, passed upwards, fracturing the carpal bones and opening the joint, and continued its course up the front of the forearm, emerging just below the elbow, on the anterior aspect. He was transferred to the Steamer Baltic, Surgeon Franklin B. Kimball, 3d New Hampshire, in charge. Dr. Kimball amputated the forearm in the middle third by the circular method, chloroform being the anæsthetic. The patient's general condition was good, and he made a rapid recovery. On the 19th, he was admitted to Hampton Hospital, Fortress Monroe, Va., February 14th transferred to Webster Hospital, Manchester, N. H., and April 28th was discharged from service. The stump, however, was painful from the first, the pain often extending up the arm and into the neck and head.

In May, 1882, his condition was as follows: There was pain in the stump, radiating to the head, as just stated, neuralgia of the heart, imperfect vision, requiring the use of glasses, and the left eye nearly useless. The slugs remained in the chest and right arm.

One day during this month he fell down a steep flight of steps, striking his left shoulder in the fall; he was nauseated, and felt a sharp smarting pain in the left hand and arm and down the spine. These symptoms gradually wore off, and the next morning he complained of only slight soreness from the bruise. About noon, however, I was sent for to see him, and learned that while he was writing (of course with the *left* hand),

he had suddenly lost the use of his fingers, and a moment afterwards of the arm and leg of that side. He was at once removed to his home, when it was found that there was complete paralysis of motion and sensation of the left side; he could not feel the deep prick of a pin; his eyes were very sensitive to light, and his voice was weak and tremulous. In four days, he had so far recovered as to be able to walk, but the arm and hand remained almost useless.

In the hope of benefit, the slug, which remained in the left chest, was removed by Dr. Gersdorff, of Boston, in June, 1882, after nearly twenty years' sojourn. It was as thick as a common lead pencil, was three-fourths of an inch in length, flattened at both ends, and weighed 129 grains. The numbness and coldness of the left side now gradually disappeared. In three weeks he could hold a pen and write a few moments at a time, and in six weeks, the hand and arm, with the exception of slight weakness, were as well as ever. The sight of the right eye also improved, so that he dispensed with glasses; but there was no change for the better in vision in the left eye. The neuralgia of the heart likewise ceased to trouble him.

In the spring of 1883, he consulted Dr. Burnett on account of ocular trouble. The doctor's statements and remarks are subjoined. The sensitiveness of the stump continued, and was at times exquisite. While in Boston, in the month of June, Dr. Gersdorff removed the slug remaining in the right arm; but without perceptible relief of pain.

About this time, Captain B. F. Pope, Assistant Surgeon U. S. A., Surgeon-General's office, in view of the possibility of a nerve of the stump having been included in the cicatrix, recommended excision. This operation was performed September 10th by Dr. N. F. Graham, Professor of Surgery, Medical Department, Howard University. The stump was opened, and about one-and-a-half inch of thickened and indurated tissue removed, including a portion of the radial nerve. Chloroform and ether were used as anæsthetics. After the wound had been closed by sutures an oozing took place into it, accompanied by excruciating pain and entire loss of vision. I attended him during his convalescence. The pain was partially relieved by morphia and hot fomentations, but it was necessary to reopen the wound and turn out the clot. Vision began to return thirty-six hours after the excision. The wound healed by granulation without any further accident.

At the present date, January 29, 1884, there remains a little sensitiveness in the stump when pressed upon or chilled. There is an occasional slight numbness in the left arm and hand; and there is also at long intervals a very slight neuralgia of the heart.

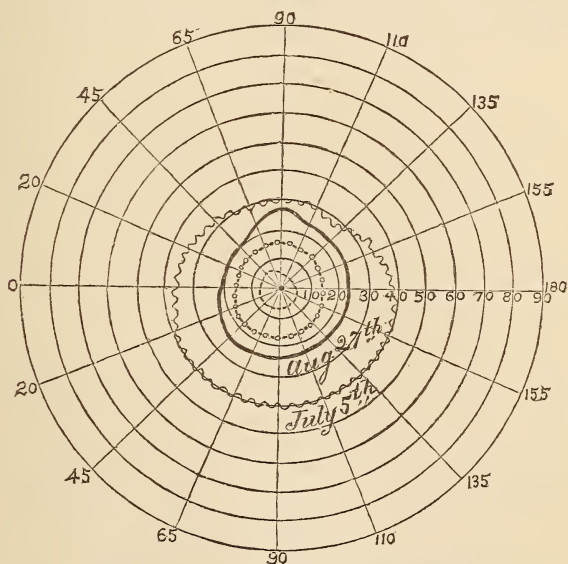
The microscopical examination of the excised portion was made by Dr. McConnell, of the Army Medical Museum. It disclosed the presence of a fibrous neuroma of the radial nerve; the growth is more vascular than the ordinary fibrous tumour; there seemed to be no increase of true nerve fibres.

Ophthalmological Notes by Dr. Burnett.—I saw the subject of the above history for the first time on the 20th of June, 1883. He came to consult me for an obstinate papillary conjunctivitis of both eyes, and a difficulty in vision of the right, which had made its appearance a short time before. The left had been amblyopic since the receipt of the injury, a detailed account of which has been given in the foregoing history by Dr. Lamb. I

found vision in this eye to be $\frac{2}{60}$, and according to the patient's statement it had remained at about this for a number of years previous. In the R. V. $=\frac{1}{4}$, but there was a want of power to use the eye for any considerable time; objects soon became dim, and in reading he used a +1 D spherical lens. The pupils were of the same size, and were normal in their reaction to light. The visual field in the left, tested roughly, was good. The ophthalmoscope showed the fundus in both eyes to be normal. There was nothing in the appearance of the optic nerve or retina to account for the low degree of V. in the left. Though he gave me a rather full history of his case, there was nothing special in his condition to call attention to any connection between the injuries and the present eye troubles. I therefore entered a diagnosis of conjunctivitis, weakened accommodation of the right eye, and amblyopia of the left, and ordered an astringent for application to the conjunctiva, and advised a rest.

Under this treatment, however, there was no improvement, and on the 5th of July, he called my attention, for the first time, to the fact that for some time past he did not seem to see objects on the ground as he was walking, in consequence of which he frequently stumbled. This led me to make a careful examination of his visual field, and I found it concentrically narrowed, as shown in the outer zigzag line in Fig. 1. There

Fig. 1.



VISUAL FIELD OF RIGHT EYE BEFORE OPERATION.

-----	Limit for white, July 5th.
.....	“ white, August 27th.
————	“ red, “ “
~~~~~	“ green, “ “
	“ blue corresponded with white.

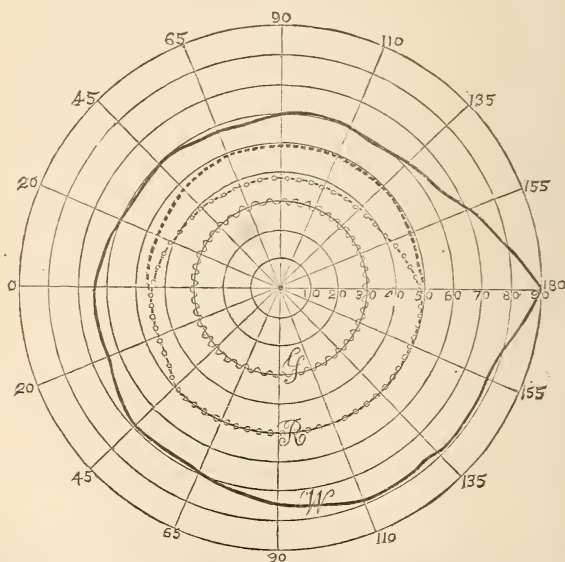
was no improvement in the condition of the conjunctivitis, though the treatment was several times changed, and the restriction of the visual



field gradually progressed until it reached the form recorded by the inner markings in Fig. 1. These fields were taken on August 27, 1883. The outer continuous line represents the limit for white. The next inner line the limit for red, and the most central that for green. The limit for blue corresponded approximately with that for white. Central vision still remained normal. An examination of the fundus failed again to detect any cause there for this manifestation. There were associated with this some symptoms referable to a deranged central nervous system. He slept badly, was restless, and had a sense of impending doom, though a man, when in health, of courage and philosophy. The stump of the right arm was painful when touched, and whenever the arm was moved and the cicatrix dragged upon. Not being able to find a sufficient cause for these symptoms elsewhere, I was forced to look upon the painful stump as a possible origin for them, and concurred in the opinion of Dr. Pope, that it was advisable to have it re-opened and examined as regards the state of the divided ends of the nerve trunks. I was the more inclined to look for good results from this from his previous history in connection with the other wounds, and from his manifest extraordinary impressionability to reflex nervous influences.

The operation was performed as above described, and he visited me at my office on the 25th of September, when I again made an examination of the visual fields of both his eyes for white as well as colour, and found that of the right eye, as represented in Fig. 2, which might be considered as

Fig. 2.



VISUAL FIELD FIFTEEN DAYS AFTER THE OPERATION.

- Limit for white, September 25th.  
 - - - - - " red, " "  
 ~~~~~ " green, " "  
 " blue, " " in the lower part of
 the field it corresponded with the limit for red.

approximating the normal. His conjunctivitis was much better, and his vision in every respect greatly improved. He was able to read without glasses, and has from that date until the present time (January 26, 1884), experienced no return of his eye symptoms, except that the conjunctiva, though much improved in appearance, is somewhat redder than normal, and he has a burning sensation in the eyes when he uses them excessively, particularly at night. He finds no use whatever for his convex glasses. The fundi of both eyes are essentially the same, and are in no wise changed from the condition found at my first examination.

Remarks.—The above case shows in a most remarkable manner the susceptibility of the eye to the influence of reflex nervous action, and in a way which appears to be unique. At least so far as I have been able to consult the literature of the subject, I have not found any case on record in which concentric limitation of the visual field of a purely functional nature, and apart from organic change in the retina, nerve, or tracts, was associated with pathological changes affecting the nervous distribution at some remote part of the system.<sup>1</sup> That the changes were for the most part functional (to use an indefinite though tolerably well-understood term) seems a legitimate conclusion from the fact that at no time were any changes observed in the parts visible by means of the ophthalmoscope, nor were the symptoms those which have invariably been found in connection with changes in the optic tracts. When these are involved we have some form of hemianopsia or sector-like defects of the V. F.; in this case the limitation was concentric. We are, therefore, forced to the conclusion that the reflex action had its effect on the cerebral centre of vision.

Of the exact nature of these changes we can have, of course, no positive knowledge; but it is certain that, so far as regards the right eye, they were not permanent, since on the removal of the exciting cause the visual function became normal again in a very short time. Why the change should take the form of a concentric limitation of the V. F. with good central vision, and not the form of a lowering of the visual power over the whole field, is a matter for speculation wholly. But that the same kind of reflex action can and does cause a lowering and even a total abolition of the visual powers as a whole, is shown by the facts of the amblyopia with good V. F. existing now in the left eye, and of the complete blindness in the right for some hours after the operation, when a blood-clot was pressing on the end of the radial nerve-trunk.

The changes, whatever their nature, we must suppose to be effected in the ultimate cerebral particles, and to be of such a character as prevents their proper response to the changes (vibratory probably) carried to them from the retina by means of the optic nerves and tracts. If these changes

<sup>1</sup> Concentric limitation of the visual field without ophthalmoscopic signs is numbered among the many phenomena of *sympathetic ophthalmia*. See one case reported by Brecht in Gräfe's Archives, B. xx. Ab. 1, p. 97 et seq. Here, however, cerebral vision was reduced to $\frac{1}{10}$.

are not of too long continuance these ultimate particles will again resume their normal action after the removal of the exciting cause; but if they have existed for some time it seems probable, if we may judge from the history of the left eye, that they remain permanent. These, however, we confess are but conjectures, though legitimately based on what positive knowledge we have been able to glean from the dark field of reflex pathology.

If we are correct in our supposition that the changes were confined to the cerebral centre of vision the phenomena may throw some light on the question as to whether there is a final crossing of the fibres of the optic tracts beyond the corpora geniculata, thus causing an entire passing over of the fibres to the opposite side and making the centre for the right eye to be in the left side of the brain. If there were only the partial decussation at the chiasma, and a portion of the fibres from the right eye went to the left and a portion to the right brain, then an affection of one centre would give rise to hemianopsic contraction of the visual fields of both eyes, since the fibres coming from the other centre would remain intact. Unfortunately the V. F. of the left eye was not accurately examined at the time of the greatest contraction of the field in the right, but it was examined roughly, by means of the hand, at the beginning when there was undoubtedly contraction of the right field and it seemed normal. It would appear, therefore, from what facts we have, that the reflex influence was exercised only in the centre for the right eye, and that must have been on the *left* side of the brain, seeming to support the theory of a final decussation beyond the corpora geniculata.

That the failure of accommodative power was due to reflex action is very definitely settled by the fact of its complete disappearance after the removal of the exciting cause; and that the conjunctivitis was either due entirely or aggravated by it is also proven by the great amelioration after the operation, though no applications were made to the conjunctiva.

Since the above notes were written the *Ophthalmic Review* for January has come to hand, containing the report of a case by Mr. Priestly Smith, which has this point in common with that of Mr. Norton, that there was concentric narrowing of the visual field in connection with diseased conditions remote from the nervous centres. In this case it was the ovaries, and the V. F. became normal when the ovaries were removed. The influence of the reflex action in this case was not felt, however, alone in the visual centre, but there was at the same time a diminution of the blood-stream in the retinal vessels, presumably through cardiac inhibition, which led to a thrombosis in the vessels of one eye. That the visual troubles were in close connection with the cardiac function was shown by the fact of the appearance of sudden total blindness on undue exertion or from any cause which was likely to weaken the heart's action.

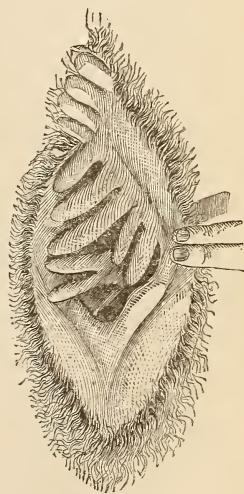
ARTICLE XIV.

A RARE FORM OF VULVAR DISEASE. By MIDDLETON MICHEL, M.D.,
of Charleston, South Carolina.<sup>1</sup>

IN a field so diligently explored as that of gynecology, it appears improbable that any phase of disease appertaining to the genitalia could have escaped detection; it is more reasonable to suppose that any very remarkable affection of the vulva, not found plainly enumerated among the diseases of this region, has been considered perhaps as a very rare variety of some other well-known disease. I am inclined to such a conjecture on the present occasion, since the nearest approach in description and appearance to the case I am here to record, is one which I have found Huguier has been ready and willing to assign to a destructive, malignant, perhaps incurable affection, familiarly known as lupus, though far better designated by the ancients under the term of esthiomenon.

As no verbal description can possibly compare with a faithful delineation from nature, the figure which I here furnish of the parts, as they appeared in my case, will liken this disease to a rare form of hypertrophic offshoots, which some writers have supposed constituted a variety of esthiomenon vulvæ, but of the pathogenesis and identity of which with the present disease I am by no means convinced.

Rhoda Robertson, a negro woman of about fifty years old, whose embonpoint, erect carriage, indeed general appearance, indicated good, if not perfect health, was admitted into the Roper Hospital of this city for certain tumours about the vulva, but particularly for the difficulty she experienced when attempting to pass her urine. Her trouble in urinating had notably increased within the last year, so much so that she could scarcely pass more than a drop or two of urine at a time without great straining and pain. The diseased condition about the vulva antedated this period of distress by two years. Under the supposition that she suffered from syphilitic vegetations, we learned that for some time an anti-syphilitic treatment had been vigorously and perseveringly instituted without any change in the condition of these growths, and with no benefit to the symptoms which specially annoyed her. Attempts at catheterism had been made, aided by sea-tangle tents, but so completely failed as to induce the belief that she suffered also from the somewhat rare condition, in a female, of stricture of the urethra. An examination revealed the presence of a number of elongated, spur- or prong-like growths of variable sizes (see Fig.); some



<sup>1</sup> Read before the Medical Society of the State of South Carolina.

about three-quarters of an inch in length, others fully one inch long; of a bleached or whitish appearance, of firm consistency, and almost scirrhus hardness. All of these acuminate growths or papillary processes rested upon an indurated base, for none of them were pedunculated; they were grouped about, and were growing apparently from the carunculae myrtiformes and fourchette; one of these mamillary projections encroached so completely upon the meatus as to nearly occlude this opening, preventing the introduction of the smallest catheter. Though confounded together by indurated tissue, which more or less surrounded and constricted the vaginal opening, producing stenosis of this and the urethral orifice, yet each of these papillary excrescences was entirely independent of the other, exhibiting the same elastic, fibrous, even cartilaginous texture from summit to base. Their whitish aspect contrasted with the vulvar mucous membrane in its healthy portions, showing them to be void of all vascularity, for they had never bled; and they were insensitive to such applications of caustics as had been made to their surfaces from time to time. Manipulating them produced neither bleeding nor pain. The general appearance on opening the vulvar sinus might be aptly compared to the well-known aspect of the papillary layer of the skin, remembering, of course, that its conical papillae, so familiar to histologists, are necessarily microscopical; that they are often *compound*, presenting two or more points springing from a single base; besides being vascular and supplied with nerves and lymphatics. The present formations were, as we have said, entirely devoid of organization.

As the most urgent symptom, indeed the only one complained of, was the difficulty of micturition, I drew down one of these growths which stood as a valve about the meatus, and exerting some force with the end of a female catheter, with difficulty penetrated the meatus but succeeded in reaching the bladder very easily, which showed that the only obstruction was at the meatus; for there was no stricture properly speaking.

The acknowledged difficulty of a differentiation in cutaneous diseases too often ascribes these to a syphilitic origin when occurring upon the genitalia, as though every excrescence in this region must be of this specific nature, therefore we shall not be surprised to learn that our patient had been long under mercurial treatment; iodide of potassium, with local applications such as silver nitrate, oleate of mercury, etc., were all used, with no satisfactory results. Careful inquiry and examination, with an honest history of her case, furnished no reasons for believing that she ever had syphilis; there had never been previous ulcerations nor discharges from the vulva, and the uterus was free from disease; she had borne these tumours for two years, complained of no special inconvenience, except the constant tenesmus and pain upon urinating, which seemed to have irritated the bladder, and certainly had hypertrophied the vesical walls, as there was a slight cystocele. The insufficiency of the mercurial course, and want of resemblance of these growths to warts, cribriform vegetations, condylomata, and other syphilitic developments always accompanied by discharges and so generally to be distinguished from other diseases, seemed to corroborate the fact that there had been no antecedent syphilitic history. Nor was there any identity between the disease I am describing and the numerous vulvar growths known as cystic, warty, fatty, villous papillomata, polypoid fibroma, epithelioma, sarcoma, or carcinoma. With warty excrescences, which these prong-like developments appeared to resemble, there was this difference, that warts, whether upon the prepuce

or vulva, bleed freely if touched; secrete an offensive discharge; grow always from the integument itself; and are pedunculated. The soft and dendritic character of papillomata, which originate upon mucous surfaces, differentiates these at once; and the other forms are too characteristic to be easily mistaken.

Familiar with the development of lupus on the face and upon the vulva, in which situations it is frequently encountered, we have found it difficult, as already stated, to accept as a variety of lupus the present pathological condition we are describing. The affection before us appears confined to the vulva, and so particularly rare even in this situation that it is scarcely found mentioned in gynecological works.

Bielt, it is true, made three varieties of lupus: one he regarded as *superficial* (non-exedens) in its destructive career; the other he termed *perforating* (exedens) in its deep invasion of the tissues; while he was the first to describe as his third variety a *hypertrophic* form of development of lupus not generally noticed by dermatologists; nay, even rejected by many authorities, except Alibert and Huguier, who adopt Bielt's classification, as nothing more than the result of induration about previous seats of destructive ulceration, or as grafted upon antecedent erysipelatous or erythematous invasions of the parts. In the case before us there had been certainly no previous ulcerations, certainly no condition approaching the phagedenic processes of molecular decay commonly recognized as lupus. Even Huguier,<sup>1</sup> in his admirable monograph on this subject, acknowledges that this third variety, which Bielt terms *esthiomène hypertrophique*, is one of the sequelæ of ulcerative changes in the part, traces of which are always indicated by the corroded, jagged, or laciniated appearances of the nymphæ, labia, etc.

The absence of any such condition of the vulva in our case compels me to divorce these curious excrescences from affiliation with any form of lupus, while I am disposed to regard them as fibroid infiltration of the submucous connective tissue, a hypertrophous fibrillation of the fibro-cellular submucous tissue, together with a new issue of granulation cells infused into the connective tissue.

This is mere speculation, unsupported by any microscopical evidence, as the specimens were not examined.

Removal of these morbid products with the knife offered the only promise of immediate cure, and this was done without apparently any pain and without hemorrhage. It was with the knife in hand that I realized the truly sclerous consistence of the tissue upon which I was operating, and the surface of section was literally white when these pieces were removed. We cut away all of them, each one presenting its isolated connection with the inodular tissue whence it sprung, and the dense basal structure—which, perhaps, I improperly term inodular, as it was in no respect cicatricial—this dense basal tissue extended beyond and about the orifices of the vulvar fissure, everywhere exhibiting a smooth unbroken surface, and nowhere presented the tattered or jagged aspect of structures

<sup>1</sup> Huguier, Mémoire sur l'Esthiomène, Paris, 1849.

that had previously been ulcerated or partially destroyed by some phagedenic disease. So wholly different were these appearances from anything I had ever seen before, that I have been led to reflect, had they occurred in the experience of others, some notice would surely have been made of them in systematic treatises of diseases of women. As already stated, Huguier is the only author who has represented in one of his plates a condition bearing a resemblance to the figure accompanying this article, yet he therein particularly exhibits the scalloped border of the nymphæ, so indicative of former ulceration which he says precedes such changes of structure, whereas in the present case no such corroded state existed, so that I have especially called up this remark, as insisting upon a very marked difference between malignancy and benignity in these two forms of disease. With rodent ulcer, lupus, elephantiasis, all of which affections I have repeatedly seen occupying the vulva, there was no resemblance whatsoever.

Now, whether this operation was destined to relieve our patient was a matter of importance in determining whether the disease was malignant and would return, she was therefore watched carefully, and the simplest dressings used intentionally to resolve the indurated tissues involving, we may say, the entire *introitus vulvæ*. Nothing seemed more appropriate than glycerine, for the hygroscopic properties of which for such a purpose we are all so much indebted to Marion Sims; dossils of lint well saturated with glycerine, and nothing more, were kept well insinuated within the vulvar sinus, and in a few weeks this simple treatment had the wonderful effect of dispersing all morbid deposits, whatever these may have been, and the parts were restored to a more natural condition. This remarkable change first occurred about the meatus, and the consequent relief upon voiding urine became daily more and more conspicuous. Having secured her address before her discharge from the hospital, I had the opportunity, within the past few days, of examining her present condition, now two years since the operation, and can state that I found her perfectly well, there being no trace of the former disease, and a thoroughly normal state of the parts restored. No form of lupus with which I am acquainted could likely have terminated thus, either in appearance or in cure.

Though one may still see a likeness to my case in the excellent representations of one of Huguier's figures, yet the differences which we have mentioned make this after all but a simulated resemblance. In Barnes I find a verbal description of an occasional *warty* form of excrescence, but the characteristics of these bleeding growths would seem to me, from what I have above stated, to point to a great difference between such product and those we are describing. Barnes writes of certain growths as occupying "the vestibulum, meatus urinarius, carunculæ myrtiformes, or some of the other parts ordinarily concealed within the vulvar sinus. Their

structure is firm, but they are remarkably pale in colour and semitransparent, so as to bear much resemblance to the white muscular tissue of fish." There is, as we have said, something wanting in the above description to confirm the identity of those two diseases. The transparency of the tissue appears inconsistent with the sclerous texture which our case exhibited, and the firmness referred to may doubtless not be greater than the flesh of fish with which a comparison is made.

I am doubtful by what name to designate the affection under consideration. Its true fibrous nature must of course be admitted. If we term it acuminated fibroma or fibromata, a form of morbid development mentioned by Virchow, we admit its identity with such new growths, but these neoplasms are often vascular; a cavernous network of vessels fixed within the trabeculæ of a fibrous stroma when cut cannot and do not retract, and sometimes profuse hemorrhage supervenes; and though they may be developed from submucous tissue, they are generally surrounded by and grow within a capsule; and if of any age or duration they ulcerate, particularly such as spring from mucous surfaces; then, again, they are often multiple, coalesce with one another, and are also pedunculated. We must hesitate to regard these pointed outgrowths of cartilaginous texture as ordinary warts, growing as they obviously did from an essentially mucous surface; unless their originally soft or mucous structure be supposed to have assumed gradually a cutaneous character from exposure beyond such a surface, and subsequently through irritation to have acquired the denser nature, first of fibrous, then of cartilaginous, and finally of horny structure.

But, if we view these coriaceous callosities as deteriorations of mucous epithelium, and perfectly benign in character, yet their development upon such an anatomical surface, and particularly in such a locality, constitutes nevertheless a truly anomalous phenomenon, not easily forgotten by those who might have likened the eversion of this woman's vulvar sinus bristling with its many spines to the tentacles around the buccal orifice of an actinia among the class of polyps.

Even under this hypothesis respecting them they surely represent a very rare if not a hitherto undescribed condition of disease about the vulva.

39 SOCIETY STREET, CHARLESTON, S. C., Oct. 1883.

ARTICLE XV.

CEREBRAL AMAUROSIS FOLLOWING AN INJURY TO THE HEAD. OCCURRENCE OF GASTRIC CRISES. By ROBERT KIRKLAND, M.B., of Cheltenham, England.

AMAUROSIS, used in the restricted sense, as meaning impaired vision and blindness due to extra-ocular causes, depends as a rule either on gross disease of the cerebrum or cerebellum, or on spinal lesion, as locomotor ataxy and paraplegia. Some uterine derangements may also cause it; and it has resulted from post-partum hemorrhage. Injury or disease involving branches of the fifth nerve has induced blindness from reflex irritation. Amaurosis following injuries to the head arises from the acute or chronic meningitis thus set up, or from hemorrhage. The inflammatory symptoms descend along the trunk of the optic nerve to the eye, and white atrophy sooner or later ensues. Atrophy may come on, however, without neuritis.

In the boy Henry C., æt. 13, the subject of this case, blindness came on about twelve months after he had apparently recovered from all effects, of an injury to the head. Six years ago he fell on a slate, and cut the forehead from the inner third of the right supra-orbital arch up towards the scalp. There was also a cut underneath the eye in a line parallel with the nose. The right eye was ecchymosed. He was quite unconscious, and was carried to a doctor, who dressed the wounds, examined the eyes, and stated they had received no injury. For two days he was semi-unconscious. On the third day he was able to be up, and in a fortnight he went to school, which he attended for about a year, was able to read, and do his work. His schoolmaster then noticed that he brought his books near to his eyes while reading, and that this impairment grew worse. He then attended an ophthalmic institution for three months; but his sight became more affected, and he became totally blind.

After three years had passed he was sent to the Royal London Ophthalmic Hospital, and was under the care of Mr. Lawson, who diagnosed white atrophy following an injury to the head. About the time of his going to London he had repeated attacks of vomiting, with pain, and he was noticed to scuffle his feet along the ground while walking, as if incapable of lifting them. Occasionally, too, he was observed to stagger. Immediately after the injury there had been no vomiting, no complaint of headache, except occasionally in the morning, and no convulsions.

My first visit to the boy was on November 7, when I was requested to see him on account of severe gastric pain with vomiting. The pain had come on suddenly, and was not unlike that of lead colic. There was nothing I could detect as regards diet, nor any stomach or intestinal mischief that could satisfactorily account for this sudden epigastric pain. His friends told me he frequently had attacks like this before. They would come on suddenly without any warning, and so painful were they, that they bent him double and made him shriek out. Sometimes they followed immediately after a meal, but as often they occurred between meals. As a rule they were accompanied by vomiting. The action of the bowels seemed to produce no modification on them. His tongue was quite clean

and his appetite very good. He has often slight uneasiness over the epigastrium; but the acute exacerbations are very variable in their occurrence. Weeks may pass when he is comparatively free from pain; at other times they come on almost daily. Rectal tenesmus is sometimes superadded to the vomiting and cardialgic pains.

His mental condition is much impaired. The pupils are dilated and fixed, giving to the eyes a peculiar vacant stare. He often puts his hand up to the nape of the neck as if in pain there. On trying to walk he drags the feet along the floor, and is constantly tottering. When standing with the feet close together he would fall to one side unless supported. When lying down, he can appreciate perfectly whatever position his limbs may be placed in. The patellar tendon reflex of both legs is exaggerated; and on dorsal flexion of the feet slight ankle clonus is produced. Cutaneous sensibility is retained. In other respects he is healthy and well nourished. There is no disease of the lungs; and the urine contains neither sugar nor albumen. There is no history of phthisis in the family.

For more than a month there has been no recurrence of these sudden epigastric pains, though the vomiting has been persistent. Looking over Trousseau's lectures on locomotor ataxy, I found he recommended belladonna and turpentine for the lightning pains, so I gave the boy a mixture containing tincture of belladonna with the bromide of potassium. This neither relieved the epigastric uneasiness nor the acute pain. Strange to say, for the last three days the vomiting has been very much lessened after he had carbolic acid in one grain doses three times a day. One can hardly depend on this being the *propter* as well as the *post hoc*, although the friends believe in its efficacy for the time being, and that is something.

Remarks.—Contusion of the brain seemed to have resulted from the fall, and its effects, I believe, are now complicated with tumour of the cerebellum. Dr. Stephen MacKenzie points out how often blows on the head play a prominent part in tumour cerebri. It is difficult to say whether the blindness and psychical disturbance are due to chronic meningitis or to the possible existence of a tumour. A necropsy can only clear this up. What makes the case interesting is the occurrence of well-marked gastric crises in every way resembling those of locomotor ataxy. These cardialgic attacks have also been observed in spinal general paralysis. This symptom *per se* would be therefore of little avail in any doubtful case of locomotor ataxy, as it seems in no way special to that disease. Even the severe lightning pains which Duchenne lays so much stress on in the diagnosis of the disease in its first stage may occur in cases of tumour cerebri; for Charcot mentions a case where lightning pains in the limbs were very severe in a person suffering from tumour of the occipital lobe. Moreover, it is between tumour of the cerebellum and locomotor ataxy that in a few cases differential diagnosis is difficult. In this instance the latter disease is easily eliminated by the age of the patient, by the presence of knee-jerk and cutaneous sensibility, and also by the dilated pupils. The blindness following locomotor ataxy, as Duchenne has shown, being mostly accompanied by obstinately contracted pupils.

ARTICLE XVI.

THE DIAGNOSIS OF TYPHUS FEVER. By A. RANDOLPH MOTT, M.D., Resident Physician Riverside Hospital, Health Department, New York City.

DURING a period in which 771 cases of typhus fever were treated at the Riverside Hospital, there were admitted 108 patients who were classed as "improper subjects."

These patients had been seen by one or more physicians, and in certainly half the number the unqualified diagnosis of typhus fever was made; the rest were considered to present symptoms sufficiently suspicious of this disease to warrant isolation for further development, and were, therefore, admitted to the quarantine wards of the hospital.

An enumeration of the diseases with which these patients were affected, and the number of cases of each disease, is as follows:—

Classification of 108 Cases mistaken for Typhus Fever.

| | | | |
|---|----|--|----|
| <i>Febrile Affections (38).</i> | | <i>Affections of the Intestinal Tract (7).</i> | |
| Smallpox | 8 | Dysentery | 2 |
| Measles | 1 | Diarrhœa | 2 |
| Scarlet fever | 1 | Constipation | 3 |
| Typhoid fever | 12 | | |
| Malarial fevers | 13 | <i>Affections of the Throat and Lungs</i> | |
| Febricula | 1 | (22). | |
| Urethral fever | 1 | Acute pharyngitis | 2 |
| Rheumatic fever | 1 | Pneumonia | 8 |
| | | Phthisis | 7 |
| <i>Affections of the Nervous System (15).</i> | | Pleurisy | 2 |
| Meningitis | 3 | Bronchitis | 3 |
| Cerebro-spinal meningitis | 3 | | |
| Insanity | 1 | <i>Traumatism (1).</i> | |
| Spinal sclerosis | 1 | Sprain of ankle. | 1 |
| Alcoholism, acute | 6 | | |
| Insolation | 1 | <i>Affections of the Kidneys (1).</i> | |
| | | Pyelitis | 1 |
| <i>Affections of the Skin (10).</i> | | | |
| Purpura | 1 | <i>Unclassified (14).</i> | |
| Erythema | 3 | Scrofula | 1 |
| Erysipelas | 1 | Debility | 11 |
| Acne | 1 | Malingering | 2 |
| Syphilis | 1 | | |
| Phthiriasis | 3 | | |

There is included in this table nearly every disease which writers mention as liable to be confounded with typhus fever; and it may be observed that the frequency with which any disease was mistaken does not indicate the comparative closeness of its resemblance to typhus. Thus, there were three cases of erythema, and but one of measles, yet all writers declare that the latter is sometimes distinguished from typhus fever with much difficulty.

Smallpox and typhus may have the same premonitory symptoms, and

the eruption of smallpox is sometimes preceded and accompanied by a general *erythema*—the *roseola exanthematica* of some authors—in which the early macules and papules of an irregular eruption slowly appear. It is generally stated that this condition is most frequently seen in those for whom the disease has been modified by vaccination, but it may be noted that of the eight cases of the table, in all of which this symptom was present, four died of malignant smallpox.

Thirteen cases of typhus were sent to the hospital as smallpox, making twenty-one instances where these affections were confounded. A positive opinion was not often declared concerning these cases, and indeed twenty-four or thirty-six hours would sometimes elapse after the appearance of the eruption, before it could be decided whether a patient should be admitted to a typhus or a smallpox ward. Except, however, in some petechial forms, the eruption of smallpox will usually lose in a very few hours all resemblance to that of typhus.

Measles, especially the hemorrhagic variety, is more often mistaken for typhus than this table indicates; for during the prevalence of typhus fever very few cases of measles, and not many children of any class, were accepted at the Riverside Hospital. In the case referred to in the table, and in two of typhus, where measles was the first diagnosis, the patients were all adults. The symptoms of measles, other than the eruption, must be depended upon for a correct diagnosis. The spots of the typhus eruption are not infrequently quite as bright as are those of measles, and they may also, in the early stage, disappear on pressure, and be slightly elevated above the surface. The presence or absence of the *roseola* in the face is not sufficient to establish a diagnosis; the eruption of measles, though commonly abundant in this region, may be confined to the trunk and extremities, while that of typhus is occasionally well marked on the face and neck.

Scarlet fever was in but one instance supposed to be typhus. In this case the eruption was of the ecchymotic form sometimes seen. From an institution, in which scarlet fever was prevailing, a number of children were received, and, among them, ten were found to be affected with typhus.

Typhoid fever, in the twelve cases of the table, presented most frequently an abundant eruption as the misleading symptom. Only two cases, of the few received with a diagnosis of typhoid, proved to be typhus.

But the difficulty of distinguishing between these diseases is well illustrated by two instances, in which a number of boys living in public asylums were affected with symptoms of both fevers. In the first there were, perhaps, twenty patients under observation for several days before typhoid was diagnosed, chiefly by the characters of the eruption, which, in many cases, was profuse. In the other instance there were fourteen patients,

and here no diagnosis could be made, although the febrile symptoms were, in the majority, marked, and the eruption usually abundant. After a few days, however, an adult attendant from the same institution was admitted with undoubted typhus. In each instance the diagnosis was confirmed by autopsy.

Malarial fevers presented an assorted group, in which were found pernicious (one case), intermittent, remittent, and those irregular forms which are accompanied by a history of a recent malarial disease, which yield to quinine, and improved hygienic conditions, and in which, finally, a diagnosis is arrived at, perhaps too often, by exclusion.

Nervous affections are often differentiated with difficulty. Alcoholism not infrequently presents many of the symptoms of typhus; but there is generally no eruption of any kind, and very rarely any elevation of temperature. In meningitis, the resemblance is sometimes yet closer. In one instance; a case of cerebro-spinal meningitis was under observation for ten days before it was suspected of being other than typhus fever.

Affections of the skin should never be mistaken for typhus. There are certain eruptions which may take the appearance of the typhus rash, as seen in some syphilides and in purpura, but other symptoms of the fever are conspicuously absent.

Affections of the throat and lungs numerically head the above table, yet these were the cases which were most frequently sent for quarantine purposes, and could generally be distinguished from typhus after, at most, two or three days for observation and physical examination. Certainly phthisical subjects are not exempt from typhus, but the other affections rarely occur as complications before the end of the second week.

Affections of the intestinal tract sometimes give rise to symptoms which are common at the onset of typhus; indeed, Buchanan (Reynolds's *System of Medicine*) says that "it is particularly difficult to separate the invasion of typhus from an attack of acute dyspepsia."

Pyelitis is the only disease of the kidneys mentioned, but it is very probable that many of the cases of "debility," for the careful examination of which there was no opportunity, owed their symptoms to disease of these organs.

It is obviously improper to declare that the total numbers given above indicate correctly the proportion of mistakes made in the diagnosis of typhus fever, in the same manner that similar numbers would do were it a non-contagious disease. Still, that the frequency of mistake is not entirely dependent on the necessity for making a prompt disposal of such cases, in order to prevent the spread of contagion, is shown by the much smaller number of errors made in the diagnosis of smallpox, a disease certainly as much feared as typhus. Of 1134 cases, sent to the hospital as smallpox, the diagnosis proved to be correct in 1113, leaving but 21 improper cases. (These are the numbers for one year.)

But the symptoms of typhus fever are certainly not so distinctive in its first week as are those of any other eruptive fever, and it is generally within this period that a diagnosis must be made; moreover, typhus is met with in this country only at intervals, sometimes of years, and it is rarely seen at all outside of our seaport towns; consequently but few physicians can have any practical knowledge of the subject. The descriptions to be found in books will hardly justify an early diagnosis. Murchison, in his exhaustive article on this subject, says, of the invasion, "most commonly there are no marked rigors, but merely a feeling of chilliness." But Niemeyer says, that it "generally begins with a single protracted chill of great violence," and Beveridge (Quain's *Dictionary of Medicine*) declares that it more commonly begins in a well-marked way, but frequently nothing definite indicates its commencement. Subsequent symptoms are "pains and aching in the limbs, headache and a feeling of prostration, chilliness, loss of appetite, a furred tongue, and fever; the temperature may be five degrees above normal in the first week. The face is flushed and dusky, and conjunctiva injected." (Murchison.)

"The patients usually lie in a state of apathy, others are restless and can scarcely be kept in bed. . . . Not infrequently the headache is relieved by nose-bleed." (Niemeyer) "At the outset, the pulse is full and decided, it speedily becomes soft and easily compressible. . . . Symptoms of catarrh are not uncommon," and "intestinal catarrh and moderate diarrhoea are not of rare occurrence." (Lebert in *Ziemssen's Cyclopædia*.) It should be remarked that the diarrhoeal stool of typhus does not present any of the characters of the typhoidal stool, and is unaccompanied by abdominal symptoms. Indeed, in the early history of a case, this symptom has often to be ignored altogether, as it will be found that some household cathartic has been used which has produced this effect.

Thus far there is nothing to distinguish the affection from many others. About the fourth day the eruption appears, with the descriptions of which all are familiar.

This eruption is usually described as characteristic; "without it," says Murchison, "a certain diagnosis is impossible." Yet this symptom is absent altogether in some cases (about ten per cent.), and its distinguishing features are frequently not well marked until several days after its appearance, and sometimes not at all.

Lebert says he "must protest against its possessing any specific character;" he thinks "it does not perceptibly differ from that of typhoid, and is to be distinguished from it by its profusion and extent over trunk and extremities."

An uncomplicated case of typhus, presenting in a marked manner a majority of the symptoms—the facies and eruption, the febrile and nervous symptoms—should be recognized without much difficulty, but

this condition is not often reached within the first week, to which period the greater number of cases in the above table were supposed to belong.

The liability to mistake typhus is increased by a variety of general conditions. Occurring for the most part among the inmates of tenement and lodging houses, the very conditions which are supposed to originate the fever may serve to mask its features. It is easy to see how a patient of this class, accustomed to misery and filth, and unaccustomed to seek relief for the lesser complaints, may present many of the symptoms of typhus.

Poorly nourished or bloated by intemperance, his temperature may be elevated by some transient cause, or there may be an exacerbation of some chronic disease, which most of his kind possess. The skin of such persons is rarely healthy throughout its surface, and may present a syphilide, an acne, or phthiriasis, so modified and so indistinct, by reason of filth, as to resemble the rash of typhus, while any symptoms which may be wanting will be supplied by the ready tongue of the patient, or perhaps by the anxiety of the observer.

The brief history of a case illustrating some of these difficulties is as follows:—

A man about thirty-five years of age was brought in from the street, unconscious, and supposed to be drunk. The body was fairly nourished, the surface was of a dusky hue, the face flushed, the eyes injected, the pupils small. Over abdomen and chest, and upper parts of arms and thighs, were scattered, rather profusely, small petechial spots, for the most part of minute size. The axillary temperature was 104° ; the pulse 120, full, soft, and compressible; the respirations were 36 to the minute.

Dr. E. G. Janeway saw the patient, and while concurring in the opinion that the case was probably one of typhus, he saw nothing in the conditions which might not be as well explained—in the absence of a previous history—by the presence of acute ulcerative endocarditis. The following day the condition of the patient was not materially changed. The temperature was $104\frac{1}{4}^{\circ}$; pulse 148; respirations 40. It was now noticed that there was some paralysis of the left arm; as the man lay quiet it is not known whether this was present on the previous day or not.

On the third day the patient died. Autopsy ten hours after death. Surface still dusky; eruption persistent. Brain, old cyst of right frontal lobe; embolus of right middle cerebral artery. Lungs normal. Heart, well marked ulcerative endocarditis. Spleen normal in size and consistency, and not enlarged and softened as usually seen in those dead of typhus; there were several red infarctions. Kidneys, multiple emboli. Other organs normal.

There was still a possibility that typhus had existed in conjunction with the above-mentioned conditions, but investigation of the man's previous history proved the contrary. He was known to be an epileptic, and had not been in very good health for some months, but had continued at his work. He was employed as driver of a coal cart, and on the day of his admission to the hospital had been at work for several hours when he fell from his seat and was in an unconscious state.

ARTICLE XVII.

THE PRESENT STATE OF OUR KNOWLEDGE RESPECTING THE CONNECTION BETWEEN ECZEMA AND AN AFFECTION RESEMBLING ECZEMA OF THE NIPPLE, AND A MALIGNANT DISEASE OF THE BREAST. By WALTER F. ATLEE, A.M., M.D., of Philadelphia.

IN the *St. Bartholomew's Hospital Reports*, for 1874, is the often referred to paper of Sir James Paget, entitled "On Disease of the Mammary Areola preceding Cancer of the Mammary Gland." The whole paper is very little over two pages in length. He says:—

"I believe it has not yet been published that certain chronic affections of the skin of the nipple and areola are very often succeeded by the formation of scirrhous cancer in the mammary gland. I have seen about fifteen cases in which this has happened, and the events were in all of them so similar that one description may suffice.

"The patients were all women, varying in age from forty to sixty or more years, having in common nothing remarkable but their disease. In all of them the disease began as an eruption on the nipple and areola. In the majority it had the appearance of a florid, intensely red, raw surface, very finely granular, as if nearly the whole thickness of the epidermis were removed; like the surface of very acute diffuse eczema, or like that of an acute balanitis.

"From such a surface, on the whole or greater part of the nipple and areola, there was always copious, clear, yellowish, viscid exudation. The sensations were commonly tingling, itching, and burning, but the malady was never attended by disturbance of the general health. I have not seen this form of eruption extend beyond the areola, and only once have seen it pass into a deeper ulceration of the skin after the manner of a rodent ulcer.

"In some of the cases the eruption has presented the characters of an ordinary chronic eczema, with minute vesications, succeeded by soft, moist, yellowish scabs or scales, and constant viscid exudation. In some it has been like psoriasis, dry, with a few white scales slowly desquamating; and in both these forms, especially in the psoriasis, I have seen the eruption spreading beyond the areola in widening circles, or, with scattered blotches of redness, covering nearly the whole breast.

"I am not aware that in any of the cases which I have seen the eruption was different from what may be described as long persistent eczema, or psoriasis, or by some other name, in treatises on diseases of the skin; and I believe that such cases sometimes occur on the breast, and after many months' duration are cured, or pass by, and are not followed by any other disease. But it has happened that in every case which I have been able to watch cancer of the mammary gland has followed within at the most two years, and usually one year. The eruption has resisted all the treatment, both local and general, that has been used, and has continued even after the affected part of the skin has been involved in the cancerous disease.

"The formation of cancer has not in any case taken place first in the diseased part of the skin. It has always been in the substance of the mammary gland, beneath or not far from the diseased skin, and *always with a clear interval of apparently healthy tissue.*

"In the cancers themselves, I have seen in these cases nothing peculiar. They have been various in form; some acute, some chronic, the majority following an average course, and all tending to the same end; recurring if removed, affecting lymph-glands and distant parts, showing nothing which might not be written in the ordinary history of cancer of the breast.

"The single noteworthy fact found in all these cases is that which I have stated in the first sentence, and I think it deserves careful study. For the

sequence of cancer after the chronic skin-disease is so frequent that it may be suspected of being a consequence, and must be always feared, and may be sometimes almost certainly foretold."

Paget believes that a nearly similar sequence of events may be observed in other parts. A persistent rawness of the glans penis, like a long-enduring balanitis, has been often followed after more than a year's duration by cancer of the substance of the glans. A chronic soreness or irritation (of whatever kind) on the surface of the lower lip often long precedes cancer in its substance, and superficial syphilitic diseases of the tongue are frequently followed, and not superseded, by cancers which do not always appear to commence in a diseased part of the tongue. For an explanation of these cases it is suggested that a superficial disease induces in the structures beneath it, in the course of many months, such degeneracy as makes them apt to become the seats of cancer; and that this is chiefly likely to be observed in the cases of those structures which appear to be, naturally, most liable to cancer, as the mammary gland, the tongue, and the lower lip. In other words, an adjacent disturbance of nutrition may hasten, and make prematurely sufficient, the degeneracy of parts which may come naturally in old age, and make them apt for cancer.

The object of this paper is set forth as concisely and as clearly as it is possible to do. It is most certainly to call attention to the fact that in a number of cases, some fifteen in all, in women of forty years of age and upwards—at the time they are most apt for cancer—after the skin of the nipple and areola had been diseased for some time—in none was it for longer than two years, and in only one did the affection pass into a deep ulceration after the manner of a rodent ulcer; scirrhus cancer followed in the mammary gland. And the fact is called attention to because the sequence of cancer after chronic skin-disease is so frequent that it may be suspected of being a consequence.

Since the appearance of this paper two papers have been published in *The American Journal of the Medical Sciences* having reference to it: one in the July number of 1883, entitled, "Two Cases of Paget's Disease of the Nipple;" the other in the January number of the present year, also relating two cases of disease, with the title, "Paget's Disease or Malignant Papillary Dermatitis (Thin)." Of these four cases, it is difficult to reconcile the description given with the symptoms so lucidly described by Paget. In one the disease of the nipple had existed for ten years, and no evidence of cancer was yet seen in the breast. In the other the disease of the nipple had begun six years before, and in this, it is said, the breast was in places distinctly lumpy, hard, and even knotted, feeling like an ordinary scirrhus in the early stage. This was a recent development, according to the patient. In the other paper, one case died of an affection in no way due to the disease in question some twelve years after it began, and there is nothing to show that the mammary gland had then become carcinoma-

tous. In the second case the disease of the nipples had existed more than three years, and yet nothing had shown itself in the mamma.

Now I cannot grant these cases to be those to which Paget calls attention, though one of the writers considers his as "well-marked typical cases of the disease he has described."

"The single noteworthy fact" in his cases, to use Paget's words, "is that certain chronic affections of the skin of the nipple and areola are very often succeeded by the formation of scirrhus cancer in the mammary gland." In none of these cases, though of so long standing, are we at all sure that this had occurred. In all of Paget's cases, it did before two years had elapsed, and it was because it did, and for no other reason, that he called attention to these cases. It is not as cases of obstinate sore nipples that he speaks of them, but as cases where cancer was a sequence to and may be a consequence of the sore nipple. The papers are valuable, nevertheless, as the authors, who are skilled clinical dermatologists, point out some distinguishing marks between the intractable disease they describe and ordinary eczema. The itching was insignificant until this disease had lasted several years, whereas in eczema it is one of the signs first noted. The outline of the lesion was sharply defined and circumscribed, and the border was slightly elevated. The colour was more brilliant and more marked. The infiltration was firm and hard, while in eczema it is soft.

In England several papers have appeared having reference to Paget's communication. One is by Henry Trentham Butlin, "On the Minute Anatomy of Two Breasts, the Areola of which had been the seat of long-standing Eczema," in vol. lix. of the *Medico-Chirurgical Transactions*. In neither of these cases, as in those just mentioned, was cancer present, although the eczema had been of long duration; but the changes found on microscopical examination, after removal of the breasts, are given, and they are very striking. The alterations in the ducts, and more especially in their epithelial elements, remind one forcibly of the early stages of proliferating intra-cystic growths.

Another paper in the ensuing volume of the *Transactions* is one entitled, "On the Minute Anatomy of Two Cases of Carcinoma of the Breast, preceded by Eczema of the Nipple and Areola." In one case the carcinoma had been noticed only for seven weeks, and had been preceded by an eczematous condition of the nipple and areola only about a fortnight. In the second case—which was one of Paget's himself—the patient had suffered from the eczema about three years, and the breast became affected three or four months before its removal. In these cases the same changes were found at the microscopical examination as those before described by Mr. Butlin, and they had extended further. The acini and ducts were more enlarged, so that they had frequently become confluent from the breaking down of the partition walls, and their contents had made their way into the surrounding tissues.

From these and the two former cases the following conclusions may, Mr. Butlin thinks, fairly be drawn :—

1. That a certain relation existed between the eczema of the nipple and areola and the carcinoma of the breast.
2. That one of the first effects of the eczema was to produce proliferation of the mucous layer of the epidermis of the parts affected.
3. That in time the epithelium lining the galactophorous ducts became affected in like manner.
4. That the disease travelling along the large ducts reached the smaller ducts and acini, which became dilated and filled with proliferating epithelium, which was, at length, so to speak, discharged into the surrounding tissues.
5. That the carcinoma thus formed was, therefore, essentially a disease of epithelium.

In vol. lxiii. of the *Transactions* of the same society is a paper by Henry Morris, entitled, “On Two Cases of Carcinoma of the Breast, preceded by so-called Eczema of the Nipple and Areola.” These cases differ from any others hitherto reported, by giving the complete clinical history and the conditions found after death. In one the so-called eczema of the nipple and areola, beginning at thirty-five years of age, was followed after six years by ulceration of the nipple and carcinoma of the mamma; and after its removal the cancerous disease recurred in the periosteum, liver, and cicatrix, and caused death in about two years from the time of the operation. In the second case, after some five years, a similar disease, beginning when the patient was twenty-nine, was followed by cancer of the mamma and lymphatic glands; she died of broncho-pneumonia within three months after an operation for their removal, and cancerous infiltration was found in the lungs, bronchial glands, liver, and supra-renal capsules.

The differences between these cases of Mr. Morris and those of Sir James Paget are, that the eruption extended beyond the areola and the ulceration of the skin was somewhat deeper, that the eruption preceded the cancer some four or five years at least, and the patients attacked were younger. This paper of Mr. Morris ends as follows :—

“During the years from 1872 to 1878 inclusive, I have seen in the cancer outpatient department of the Middlesex Hospital 585 cases of cancer or imputed cancer, in 305 of which the seat of disease was the mamma. The above cases are the only instances in which eczema of the nipple and areola has been associated with cancer of the breast. Nor have I learnt from the subjects of the mammary cancer that they had previously suffered from either eczema or psoriasis of the nipple. In eighty instances there was eczema of the nipple, but no cancer.”

These two cases of Mr. Morris, together with two others of a similar kind, are the subject of a paper by Dr. George Thin, published in the *British Medical Journal*, May, 1881. It is entitled “Malignant Papillary Dermatitis of the Nipple and the Breast-tumour with which it is found associated. Illustrated by specimens exhibited in the pathological museum of the British Medical Association at Cambridge.” This paper is

illustrated by twenty-one wood-cuts. It shows that the peculiar condition of the nipple and areola in these four cases was not one of eczema. In eczema, even in the most severe cases, the connective tissue remains undestroyed, while in these cases the connective tissue had disappeared. The rete mucosum and the papillary layer of the skin had undergone almost complete destruction; beneath the papillary layer the tissues of the skin were undisturbed. As Dr. Dubring and Dr. Sherwell, in the papers above referred to, Dr. Thin says the disease can be distinguished clinically from eczema. In the one the margin is well defined, which is not the case in eczema, and when the tissue is grasped between the fingers there is evidence of infiltration into the papillary layer. Microscopical examination showed, moreover, that the breast tumours were not cases of ordinary scirrhus or parenchymatous cancer. In these the terminal vesicles of the acini, after they begin to enlarge, rapidly lose their symmetry, and offshoots pierce the connective tissue in all directions. In the tumours examined, the tendency was to regular symmetrical growth on the circumference, more like what used to be called adenoma. They are duct cancers.

When an epithelial growth in the mamma takes its origin in the duct epithelium, if the development of columns and tubes is localized and encapsulated by a growth of connective tissue, the ordinary adenoma is produced; if, on the other hand, there is progressive destruction of connective tissue and continued growth, we have a duct cancer as the result. The stamp of origin in the duct epithelium is, however, always retained; and in some parts of the tissue round-cell masses, with columnar epithelium, will be found, making the radical distinction between this kind of tumour and scirrhus or parenchymatous cancer or cancer developed from the secreting epithelia of the acini.

The present state of our knowledge, the result of the investigations prompted by the paper of Sir James Paget, may, I take it, be stated as this: A disease is met with in the nipple and areola, resembling eczema, but capable of being clinically distinguished, and under the microscope showing distinguishing appearances, that extends into the lactiferous tubes and causes duct cancer. Moreover, in some cases the cancerous disease becomes general throughout the body.

We do not yet know, however, whether this disease is the one to which Paget called attention. His cases may, indeed, have been cases not to be distinguished from true eczema, followed by breast trouble, without direct and continuous extension through the lactiferous tubes. He says expressly, that *always a clear interval of apparently healthy tissue* existed. We do know that, in some cases, carcinoma is derived from the endothelium of the lymphatics. We have all seen, for example, after a scaly affection of the lower lip, undoubted malignant disease of the lymphatic submaxillary glands, which we were sure was not only a sequence, but a consequence.

I would call attention to the fact that before the paper of Sir James Paget, attention has been directed to this connection between affections of the nipple and malignant disease of the breast by another most eminent surgeon, and that such connection has been published. Some twenty years before the publication of Paget's paper, a clinical lecture, in which this is referred to, was delivered by Nélaton; this was published in my *Clinical Lectures on Surgery*, by M. Nélaton, published in 1855. It is as follows:—

“November, 1852. A woman, forty-five years of age, with a tumour of the mammary gland, of which she gave the following history. Six or eight months before her entrance she commenced to suffer at the extremity of the nipple; there was smarting, the epidermis disappeared, small blisters formed; in short, there was eczema of the nipple. This ulceration, at first superficial, extended and covered the whole nipple, and, after some time, the breast became hard.

“When she came into the wards there was induration of the mammary gland, the nipple was not retracted, and the gland itself was perfectly movable, both as respects the skin and the subjacent parts; and yet the tumour seemed to be very near the skin, a condition favourable to the formation of adhesions. When the pectoral muscle was made to contract, the tumour could still be moved perfectly well. The tumour, however, was very hard and lumpy; the hardness was cartilaginous, and it extended throughout the whole mass. The ganglions in the axilla were hard and enlarged, they were not painful to the touch.

“The first idea in regard to this tumour was that it was cancerous, and yet the usual circumstances did not exist. The retraction of the nipple was wanting, and also there were not adhesions with the skin, in spite of the existence of circumstances favourable to their formation. Since he had been in practice M. Nélaton said he had never seen a case of cancer without one or other of these things. He asked himself *if the affection had not arisen from the ulceration on the nipple* as an affection of the testicle follows an affection of the urethra, so this glandular affection might follow that of the nipple. As to the glands in the armpit, they are often seen everywhere where there is an inflammatory action. The question was still too new to be answered, and M. Nélaton thought it to be his duty to cut out the tumour; if not a cancer, so much the better.

“Upon examination after its removal, M. Nélaton said the tumour was evidently a cancer, in spite of the absence of signs of which he spoke. The mass was very hard, and in the galactiferous ducts was a gray matter; the tumour, he said, was evidently scirrhus, and the ducts were also affected; the glands also presented evident marks of degeneration. To explain the absence of adhesions to the skin something was found, the cancerous degeneration was deeply seated, reposing on the pectoral muscles, and *there was a portion remaining healthy*, towards the surface. No microscopical examination, so far as I know of, was made of this tumour. This patient got well without any bad symptom, and she went out with the wound entirely closed, but M. Nélaton said a relapse was probable.”

REVIEWS.

ART. XVIII.—*Transactions of the American Surgical Association.*
Edited by J. EWING MEARS, M.D., Recorder of the Association. Vol.
I. 8vo. pp. xxxi. 568. Printed for the Association, and for sale by
Presley Blakiston, Son & Co., Philadelphia.

THE Association whose transactions are contained in this handsome book is a select body of practitioners of surgery from all parts of the country. Upon its list of members and officers appear the names of many eminent men, but being a limited list, there are noticeably absent from it many others. Especially is it to be noted that quite a number of those who are best known among its members are not contributors to its volume of *Transactions*, nor so far as we can learn from the reported discussions, did they take part therein. This may perhaps be accounted for by the fact that the multiplication of societies makes demands upon their time, which some of the most successful, and therefore the busiest surgeons, find it difficult to comply with. In view of this increase of societies, and the somewhat abundant opportunities for social enjoyment and professional publication afforded at the present day, the wisdom or necessity of creating new organizations has been questioned, but the fellows of this Association may point with satisfaction to the work done at its three meetings, and recorded in this volume, as the best vindication for its existence.

As the book is an expensive one, and belongs to a class which generally has but a limited circulation, we proceed to lay before the readers of the Journal a somewhat extended analysis of its contents, in such groups as we have been able to form.

The opening paper is one by Professor S. W. GROSS, discussing the *Influence of Operations upon the Prolongation of Life and Permanent Recovery in Carcinoma of the Breast*, a subject than which there is none more important in daily surgical practice. That cancer is upon the increase, at least in this country, must be patent to any one who has much to do with external affections, and who glances his eye over the very large number of deaths attributed to it in the bills of mortality published in most of our large American cities. The views of Professor Gross are pretty well known upon this subject, and are in accord with what was at one time a desperate hope, but which has of later years become a growing conviction among men of the largest experience, that cancer begins as a local affection, and that if it is attacked sufficiently early, and with wide reaching thoroughness of operation a permanent cure may be anticipated. That life is prolonged by an operation is pretty well shown by general experience, and by the statistics referred to in this paper. The same author has also a brief article on the favourable results attending some extensive operations as shown by four patients he exhibited. At the meeting of the Association in 1883, Dr. S. D. Gross read an article

upon the importance of early operations in which he emphatically endorses the views of his son, and the operative procedure he recommends. This paper is in the nature of general propositions, which although controverted by Dr. Gregory of St. Louis, summarize the opinions entertained by a majority of the profession which their author has so long ornamented. These latter papers appeared in full in the *Medical News* of June 9, 1883.

There are three articles having to do with the ligation of arteries. The first of these is one by Professor R. A. KINLOCH, of Charleston, reporting *A Case of Supposed Spontaneous Aneurism of the Posterior Tibial Artery*. Beyond the comparative rarity of the affection, the striking feature of the case consisted in an exploration of the sac a month after successful ligation of the femoral. As a result of the incision, and the removal of the laminated clots with which the cavity of the aneurism was filled, uncontrollable hemorrhage ensued, and the patient's limb had to be amputated. Dr. Kinloch is of the opinion that inasmuch as after the establishment of the collateral circulation, both the proximal and distal ends were still patulous, a reproduction of the aneurism must certainly have resulted at no distant day, and that, therefore, the exploration did no harm. Perhaps so. But we incline to believe that we should very much prefer in our own person to test the matter by time than by an exploration which, while it tended to secure scientific accuracy of diagnosis, could end in so prompt loss of a limb. Dr. Kinloch appends to his paper a table of twenty-two cases of aneurism of the posterior tibial. The paper does not require further notice, as our readers have already had the pleasure of reading it in our issue of last October.

Much farther on in the volume Dr. J. H. PACKARD, of Philadelphia, narrates a case, in which, after an amputation at the hip, he found it necessary to ligate the primitive iliac for hemorrhage; the result was favourable, making the fourteenth recovery out of sixty-seven cases in which the operation has been done, as is shown in the table accompanying the paper. The operation was done on the spur of immediate necessity, and presented no difficulty, a much smaller incision (two and a half inches) than that usually advised being resorted to, and the artery not being seen.

The third case of vascular disease included in this collection of papers is one in which Professor RICHARDSON, of New Orleans, narrates the history of a *Traumatic Aneurism of the Femoral Artery*. Both artery and vein seem to have been injured by a pistol-ball, resulting in an aneurism of the former and a pouch-like dilatation of the latter which projected into the aneurism. Compression and ligation were resorted to without avail, and amputation was ultimately done on account of advancing gangrene. The case is both curious and interesting.

There are three papers in the volume which deal with the method of treating wounds introduced by Mr. Lister. The first is a very comprehensive and able one by Dr. JAMES L. CABELL, of Virginia, upon *Sanitary Conditions in Relation to the Treatment of Surgical Operations and Injuries*. The first portion is devoted to those general considerations, which, by securing the most perfect health, tend to secure the most rapid and perfect healing of wounds, while in the latter portion there is given an enthusiastic laudation of the Listerian methods.

The second paper is one taking very moderate grounds, by Professor BRIGGS, of Nashville, which goes over the subject of wound treatment in

a very calm and dispassionate manner, showing that modern surgery which is good is antiseptic, even though it may not be Listerian. The tone of the paper is eminently judicious.

The third paper, which, for convenience, we have thus grouped with the other two, is a vigorous and outspoken one, by Dr. B. A. WATSON, of Jersey City, *On Listerism Pure and Simple*, as opposed to any of its modifications, further than the substitution of another germicide for carbolic acid.

The discussion which followed the reading of these papers was vigorous, and not always conducted upon the lines of personal courtesy which should pertain to the deliberations of a scientific body, such as the American Surgical Association. But there seems to be a quality in carbolic acid which is manifest in most of the writings of those who use it in the quantity recommended by Mr. Lister, although we do not remember to have seen it referred to elsewhere, viz., the exceeding pepperiness it develops in its advocates. Not content with claiming results which almost transcend belief, and which the more skeptical eye is unable to perceive, they write in a magisterial tone, and in one of lofty contempt for all who fail to adopt their views, while for those who venture to appear as critics of their methods of procedure, the most withering scorn, the most vigorous condemnation is thought justifiable. The method in question is still *sub judice*, and must stand the test of time and observation. It is both unscientific and undignified to permit it to become a personal matter, giving rise to such utterances as may be noted both in the papers and the discussions which followed them.

Professor GUNN, of Chicago, has a thoughtful paper upon the *Treatment of such Fractures of the Skull as are accompanied with Depression*, and cautiously, but decidedly, seeks to advance the rule of practice so as to make obligatory the elevation of the fragments in simple depressed fractures, whether there are symptoms of compression or not. Dr. Gunn advises a speedy resort to the trephine in those chronic cases in which there is reason to suspect that cerebral irritation is dependent upon bony protrusion, and is of the opinion that rigid adherence to antiseptic rules should be observed in the application of dressings. The paper is well written and suggestive, being indicative of the change which has taken place in the professional mind within the last twenty years upon the subject of trephining. In the discussion which followed it there was a pretty general disposition manifested to draw back from the somewhat extreme views of the author of the paper, although its main conclusions received endorsement.

There are two other papers in which the use of the trephine is referred to, and for which reason we mention them in this connection. The first is an interesting description by Dr. RICHARDSON, of New Orleans, of the *Application of a Trephine to Resect a portion of Rib in Cases of Retro-costal Abscess following Traumatic Injury*. The operation is not entirely new, and is said by the author of the paper to be frequently resorted to in Louisiana with the most happy results, by permitting thorough drainage and cleansing of the abscess cavity, as doing away with the difficulty encountered in the use of drainage-tubes by the approximation of the ribs, and as the simplest and easiest method of removing a portion of so movable a bone as the rib.

Dr. S. MARKS, of Milwaukee, narrates an instructive case, in which, after three applications of the trephine, he succeeded in removing a bullet

which had remained embedded behind the sternum for more than six years. At the operation the ball was found to be resting upon the pericardium, which appeared to have undergone thickening just at that point. A very noticeable and unexplained incident in the history of the case was the occurrence of a severe hemorrhage three months after the removal of the ball, and the subsequent complete recovery of the patient. At the time of the operation it was thought to be necessary to remove the cyst in which the bullet was inclosed.

The papers upon fractures are comparatively few, the first being upon *Transverse Fractures of the Patella*, by Dr. R. J. LEVIS, of Philadelphia. Dissatisfied with the results ordinarily obtained in these cases, Dr. Levis has for many years resorted to the use of Malgaigne's hooks—or, rather, a modification of them—with good effect. He does not find their application painful, although he resorts to the use of anæsthetics before inserting the points, in order to obtain relaxation of the quadriceps extensor; he has had no joint complications, and, indeed, thinks it almost impossible to injure the joint with them. Dr. Levis never applies the hooks until the effusion following the injury has been absorbed; nor does he use them so early in the case as does his colleague, Dr. T. G. Morton. There did not seem to be a disposition on the part of the association to accept the conclusions Dr. Levis so ably brought before it, although both he and Dr. Morton spoke confidently, and on the basis of a large experience, while those who differed from them confessed to having seen but few cases comparatively. The paper would have been improved had there been added to it some statistical tables, rather than by allowing its propositions to rest upon somewhat vague statements of the large number of cases treated. It would be satisfactory, also, to know the views and practice of the other surgeons to a hospital so exceptionally favoured, as the Pennsylvania Hospital seems to be, with a comparatively infrequent fracture.

Three out of four papers upon fractures have to do with the *Neck of the Femur*. Two are by Dr. N. SENN, of Milwaukee, and two by Dr. E. M. MOORE, of Rochester. Dr. Moore calls attention to some points connected with fractures of the neck of the femur, on which his mind had undergone a change from the inspection of some specimens which had recently come into his possession. He inclines to the opinion that a blow upon the trochanter is commonly the cause; that the reflection of the periosteum, known as the cervical ligament, is generally preserved; and that through this ligament ample nourishment is furnished to the upper fragment. He doubts whether shortening of the neck can be attributed to inflammatory changes when the head of the bone and the acetabulum remain unaltered.

Placed at the end of the volume, owing to its having been received too late for insertion in its proper place, is an article on *Luxation of the Ulna in connection with Colles's Fracture of the Radius*, by Dr. MOORE. Several cases are recounted in which, upon *post-mortem* examination, the ulna was found separated from the triangular cartilage, and its distal extremity chisel-shaped, from separation of the styloid process, thrust through the annular ligament. Dr. Moore believes that this form of luxation occurs in one-half of the cases of Colles's fracture, and he is in the habit of treating such by forcible coaptation of the parts, and their retention in position by a compress with an encircling strip of adhesive plaster, drawn with such power as sometimes to tear the cloth. After six hours he divides the plaster with scissors, and, supporting the forearm with a nar-

row sling, trusts the tendons passing over the radius to keep the fracture in position, aided by the weight of the hand, and nothing else. We can hardly conceive of any one resorting to such apparatus in cases which are so satisfactorily treated by other methods.

The remaining papers are by Dr. SENN. This gentleman, in 1882, presented a specimen which he thought exhibited an intra-capsular fracture of the neck of the femur, accompanied by a clinical history of the case. This paper was pretty vigorously handled in the discussion which followed; so in 1883 Dr. Senn came before the Association with an article, which, while formidable in its length, is by far the most valuable one in the book, and which would have been better placed in a volume by itself. Beginning with quite an extended series of experiments upon the lower animals, and going largely into an examination both of surgical literature and the opinions of contemporary surgeons, Dr. Senn fortifies his previous position in a most masterly and exhaustive manner. We have not space to go into the subject, which has been a battlefield among surgeons for so many years; nor, while we look upon much of the advice given by Dr. Senn for the treatment of these cases as sound and good, are we prepared to follow him either when he proposes to secure accurate apposition of the fragments by bone pegs, or to use the ingenious modification of Malgaigne's spear, with which he proposes to maintain the impaction he believes always, or almost always, exists in these cases. But one thing is very certain, Dr. Senn has made a very notable addition to surgical literature, well worthy not only the respectful attention of the Fellows of the Association, but of surgeons outside of its limited membership.

We next notice some papers having to do directly with the surgery of bone, the first being one in which Dr. MOORE, of Rochester, tells how he divided the femur below the trochanters to correct the *deformity resulting from bony ankylosis after an unreduced luxation*. The deformity was remedied, but the attempt to form a false joint failed. The patient after some time died from phthisis, and the doctor was able to exhibit the femora to the Association. It would have added both to the value and interest of the paper had a cut of the specimens been incorporated with it.

A Résumé of the Etiology, Pathology, Diagnosis, and Treatment of Morbus Coxarius is the title of a brief article by Dr. J. C. HUTCHISON, of Brooklyn. The points of the paper are few, and we summarize them as follows: the disease may result from injury, or spontaneously as a constitutional disorder, but sometimes the dyscrasia is developed from the progress of the local disorder. Rigidity of the periarticular muscles Dr. Hutchison regards as the most satisfactory diagnostic mark in the early stages. For treatment he is content to depend upon a simple extension by the weight of the limb secured either by putting a high shoe on the sound side, or by flexing the knee of the diseased side by a splint. In no case does he advise the protective splint of Thomas, and the tenor of the article is to teach that the treatment is a more simple and satisfactory matter than the experience of the writer of this notice, who has at present some twenty cases under his charge, has found to be the case.

In a model paper on *Excisions of the Tarsus*, Dr. P. S. CONNER, of Cincinnati, narrated two cases in which he removed the whole tarsus with very good results. In one there was half an inch shortening of the limb, and three inches shortening of the foot; in the other the shortening of the leg was three-quarters of an inch, and of the foot two and a half inches. Dr. Conner has collected 108 instances in which more or less

extensive removal of the tarsus has been followed, but in only one other besides his own cases has the entire tarsus been excised. From a careful analysis of these cases Dr. Conner thinks that excision is not much, if any, more dangerous than an ankle-joint amputation, and not very much more so than a middle tarsal operation, that the disease is very unlikely to reappear, as in only three did recurrence take place, while the ultimate results as to the usefulness of the limb were in very many cases more or less satisfactory. An examination of the paper can hardly fail to convince any unprejudiced person that the propriety of an excision should always be considered before resorting to an amputation. This paper is familiar to our readers through its original appearance in our issue of October last.

Dr. BASIL NORRIS, U. S. A., in a paper on *Dislocations of the Astragalus*, narrates his experience with this somewhat rare accident, as occurring in his own person. The luxation was a simple one, and the surgeons in attendance were fortunate enough to effect its speedy reduction under ether. Dr. Norris also collects some cases of this accident as reported by others, and gives the views of many well-known American surgeons contained in letters to himself upon the subject. He is inclined to think from a case reported by Dr. Grant, in the *Canada Medical Journal*, October, 1865, that simple manipulation is more likely to be successful in effecting reduction than forced extension.

Closure of the Jaws and its Treatment is the title of an excellent article by Dr. J. EWING MEARS, of Philadelphia. A general review of what has been suggested in these difficult cases is given together with an account of a case in which Dr. Mears removed the coronoid and condyloid processes, and a portion of the ramus of the affected side, thus establishing a false joint which materially improved the condition of the patient. It was found necessary also to remove a bridge of bone which fastened the jaws together. At the same time the masseter, external pterygoid, and temporal muscles were divided. It was found necessary to resort to the use of a distending gag for some weeks, and at the time the report was made, some six months after the operation, the result was most satisfactory.

A notable case is the one reported by Dr. S. W. GROSS, and recorded in the *Medical News* of June 9, 1883, in which he operated for *removal of the right kidney*, in the person of a woman aged fifty-nine. The tumour had grown rapidly within the three months it was under observation, and as there had been hæmaturia, although many of the signs of neoplasm of the kidney laid down by Wells were absent, the presumption of malignant disease was strong, and an exploratory operation, to be converted into an extirpation if required, was advised. The operation was done under antiseptic precautions, and the kidney, transformed into a medullary carcinomatous mass, was removed. There were two points of especial interest in the operation, one being the furious bleeding which followed the division of the pedicle which had been transfixed and tied in two portions, but which was fortunately arrested by a third ligature encircling the entire pedicle; the other was the removal of the fundus of the enormously distended gall-bladder with a contained gall-stone the size of an olive. Death took place in sixty-five hours from peritonitis, complicated with suppression of urine. In reviewing the case Dr. Gross concludes that while the mortality is very great after this operation, 57.14 per cent., and while the recurrence of the disorder is only too likely, that the cases are too few to decide against its performance when

the risks and probabilities are submitted to the patient, and he concludes to avail himself of that desperate but only hope. We are not told what antiseptic was used, and are therefore unable to judge whether any relation existed between it and the suppression of urine which helped to the fatal result. Dr. Gross is of the opinion that the best incision is along the outer side of the rectus muscle, as advised by Langenbuch, rather than the median incision he adopted. There are other points connected with this interesting case which we should like to discuss were we not afraid of wearying our readers. We confess to some surprise that this admirably written paper led to no discussion by the Association, for it deals with one of the subjects than which there is none more prominently before the mind of the operating surgeon at the present day.

The Intra-Peritoneal Method of Treating the Pedicle in Ovariectomy forms the subject of an interesting paper by Dr. J. EWING MEARS, of Philadelphia, in which he reports the results of some experiments carried on by himself and Dr. Morris Longstreth, in the case of rabbits, and which, though few in number, support his belief that the method is in every way a safe one, and that nature takes care of the pedicle as well as of the ligature. Dr. Longstreth's report of the post-mortem appearances and a wood-cut accompany the paper. This paper also appeared in the *Medical News*, October 6, 1883.

Dr. R. B. BONTECOUR, of Troy, narrates his experience with *External Median Perineal Urethrotomy for Cystitis, and for the Removal of Morbid Growths from the Bladder*, to which measure he resorted with very satisfactory results in two cases. The operation is one which promises much, and has the sanction of that first-rate surgeon Sir Henry Thompson, who has reported quite a large number of cases in which he has practised it.

In this connection we refer to the description given of a *Rectal Obturator*, by Dr. PRINCE, of Jacksonville, Illinois. By means of this machine Dr. Prince thinks the position of an intestinal obstruction can be ascertained, obstinate constipation relieved, alimentation carried on, anæsthesia by alcoholic fluids secured, the blood diluted, and the temperature reduced by passing large quantities of fluid through the emunctories; and all this by means of what the doctor calls a stopper.

Premising that the ileo-cæcal valve is permeable from below, Dr. Prince believes that the alimentary canal can be made to hold three gallons of fluid before it begins to escape from the mouth. Whether he has ever thus washed out a living patient by such a revolutionary process we do not know, but he is quite confident that there would be no danger of bursting him in the process. The doctor's experience with the instrument has been confined to retaining large doses of alcohol in the bowels during severe operations, with the result of most materially lowering the temperature, but the possibilities of the invention are as we have hinted. This obturator consists of an India-rubber ball which can be inflated after it is placed within the rectum, and then the pumping process is carried on by means of a tube traversing the ball. We are not told how much muscular power is required before fluid flows from the mouth; but any difficulty in that direction could easily be overcome by attaching a force-pump to the obturator, and we wonder that its inventor has not made the suggestion instead of leaving it to us to do so. We have never used a rectal obturator; we do not know when we shall be obliged to do so; but the active surgeon cannot in future regard his armamentarium as thoroughly equipped without a machine by which he can wash his patients out from stern to stem.

Foreign Bodies in the Air-Passages is the title of a most valuable and instructive paper by J. R. WEIST, M.D., of Richmond, Indiana. It is based upon an elaborate and careful study of 1000 cases collected in great part by means of circulars, and of which but few have been used for statistical inquiry. In 1867 Dr. Weist reported to the Indiana Medical Society a much smaller series of cases, which induced him to advocate a modification of the rule, which has for a long time obtained among surgeons, viz., that generally the certainty of a foreign body in the air-passages makes bronchotomy necessary. The extension of the work then done has gone to confirm Dr. Weist in the opinion expressed at that time. In a careful analysis of the cases he has tabulated, the author of the paper shows that the percentage of recoveries following non-interference is somewhat larger than that which attends operative procedure, in the former case the deaths being 1 in 3.5 cases, in the latter 1 in 4. Dr. Weist does not discredit bronchotomy, but only seeks to show that the old rule is somewhat too broad, and to point out certain features which may help to a decision in a given case. His conclusions are that emetics and cathartics are useless, and that inversion of the body is dangerous, unless the windpipe has been previously opened; that when the foreign body is fixed, or causes no dangerous symptoms, bronchotomy should not be done; but that it should be promptly resorted to when symptoms of suffocation are present, when the foreign body is lodged in the larynx, causing œdema or inflammation therein, and when it is movable and excites frequent attacks of strangulation.

At the meeting of the Association in 1881, Dr. J. H. PACKARD, of Philadelphia, read a report of some Surgical cases, in one of which he *opened the œsophagus for pharyngeal epithelioma*. The operation was successfully done, but the patient succumbed to the exhaustion induced by the long-continued abstinence enforced by the growth before operative measures were resorted to. The other cases recorded in this paper were an extensive wound of the soft palate, and a case in which an attempt was made to get at a laryngeal growth by means of an incision through the hyothyroid membrane.

Dr. CHARLES B. NANCREDE, of Philadelphia, at the session of 1883, read a paper entitled, *Have we any Therapeutic Means, as Proven by Experiment, which Directly Affect the Local Processes of Inflammation?* which has since appeared in the *Medical News*, June 16, 1883. The result of Dr. NANCREDE's study of the subject has been to lead him to the conclusion that in the early stages, when the arteries are dilated, arterial sedatives and ergot do good by leading to contraction of the vessels, and lessening the force of the current, but that after stasis has taken place local bleedings upon the venous side of the congested part are beneficial, by creating a *vis a fronte*, by increasing the rapidity with lessened force of the circulation, and thereby promoting absorption of the effused liquor sanguinis. The discussion following this paper was quite general, for almost every one is interested to talk upon so time-honoured a subject as inflammation, and there was quite a eulogium pronounced upon the advantage of bleeding on the part of some, and decided opposition to the attempt to revive that lost art on the part of others. Judging by the active part taken in the subject by many Fellows of the Association this paper of Dr. Nancrede's was among the most successful read before it.

Removal of Meckle's Ganglion for the Relief of Trifacial Neuralgia, is the title of a paper by Dr. A. VANDERVEER, of Albany. Several cases

are reported, in which a greater or less amount of relief followed the operation. In the discussion which ensued there was a disposition to question the propriety of attacking the ganglion, yet that any measure was justifiable in these terrible cases seemed to be the conclusion of those present. The President somewhat oracularly finished the debate with "If the operation has done good, it is well; if it has not done good, it is not well." Which opinion is easily arrived at in retrospect, but does not aid very much in arriving at a decision whether to operate or not, in a given case.

Dr. J. H. BARTON, of Philadelphia, exhibited a *wire splint to make extension in cases of synovitis of the wrist-joint*, which is ingenious and constructed upon principles easily applied to other joints.

The last article which it remains for us to notice is one upon *Strictures of the Œsophagus*, by Dr. H. F. CAMPBELL, of Augusta, Georgia. It is based upon a number of observed cases which were more or less successfully treated by means of dilatation. To pass the stricture Dr. Campbell was obliged to resort to instruments of less size than the smallest Œsophageal bougies, but by patience, perseverance, and delicacy of manipulation, he was in every case successful. Owing, however, to the care and attention required for a long period by these cases, the ultimate result is not always as good as in the first series of cases reported by Dr. Campbell. But Dr. Campbell's experience is most encouraging, showing that the milder method, when combined with rectal alimentation, offers equal, if not better prospects than any cutting operation. A considerable part of the paper is taken up with remarks upon the increasing number of these cases, produced by drinking condensed lye. The evil is a great one, and Dr. Campbell is quite right in insisting that some distinguishing marks should be placed upon packages of material which is so freely exposed to the children of a family, and which produced so many distressing and fatal results. Dr. Campbell is enthusiastic upon this topic, but his observation and the treatment of the cases he reports mark him as a first class surgeon, and his communication is an excellent one.

We have now completed the task set before us, and have taken notice of every paper contained in this large and handsome volume. It remains for us only to congratulate the Association upon the number of the papers presented to it, and to express the hope that its future volumes may be as good as this, its first one. It is but right for us to add, that the laborious work of editing the volume has been most admirably done by the Society's Recorder, Dr. Mears. S. A.

ART. XIX.—*Transactions of the American Gynecological Society*. Vol. VII. for the year 1882. 8vo. pp. 485. Philadelphia: Henry C. Lea's Son & Co., 1883.

OWING to a delay in publishing the *Transactions* of 1882, and an unusually early presentation of those of 1883, we have the volumes of the two years on our table at the same time, but we shall be obliged for want of space to postpone the review of the volume for 1883. The two annual meetings were held in Boston and Philadelphia respectively, the latter having the larger attendance, and the former presenting much the larger

volume, this being due to the greater length of the papers in 1882; the number, fourteen, having been the same at each session.

The first paper in Vol. VII. is entitled, *A New Method of Exploration, with the Pathology and Treatment pertaining to Certain Lesions of the Female Urethra*, by THOMAS ADDIS EMMET, M.D., of New York. The author first speaks of the difficulties in the differential diagnosis of bladder affections, and the danger of attributing to this organ symptoms of irritation belonging to the rectum or utero-sacral ligaments. Owing to a difficulty of determining the true nature of diseases located within the urethra, he has adopted the plan of opening this canal into the vagina by incision, care being taken to leave the orifice and entrance into the bladder intact. After the introduction of a block-tin sound, he thus describes his method of procedure:—

“The operation is begun by catching up with a tenaculum the tissues on the vaginal surface, about midway between the mouth of the urethra and the neck of the bladder, and dividing them through the sound. After this entering the canal the incision is to be extended, with a pair of straight-pointed scissors, in the median line backward, towards the neck of the bladder, and forward to within a short distance of the mouth of the urethra. It is necessary to avoid dividing the urethral outlet, as it would then be more difficult to close the opening properly at a future day. And it is still more important that the incision shall stop short of the neck of the bladder without involving it, as the patient would then continue after the operation her control over the escape of urine.” . . . “The line along the vaginal surface should be made nearly a third more in length than the one through the urethral mucous membrane, and it is important that the chief difference should be at the end of the line over the neck of the bladder. We thus gain with the bevelled angles a great advantage for examining the urethral tract. Moreover, from the greater length of line being on the vaginal surface, we free the lower angle of the incision at the neck of the bladder, so that if necessary the finger, or a small speculum, can be passed into the vesical cavity with little fear of laceration or loss of control. So long as the vaginal surface is intact, the parts about the neck of the bladder remain bound down and unyielding, from the direct connection of these tissues with the subpubic ligament and pelvic fascia.”

If the exploration reveals a condition which can be at once relieved, the wound may be closed at once by silver-wire sutures which are to be passed so as to include the mucous lining of the urethra; if not, the incision may remain open, and be finally closed as in cases of fistulæ and lacerations.

The diseases of the urethra, according to the experience of Dr. Emmet, are: 1. Inflammation of the mucous membrane or urethritis; 2. Pedunculated, vascular, and neuromatoid growths; 3. Prolapse of the mucous and submucous tissues; 4. Fissures at the neck of the bladder; 5. Urethrocele, and 6. Laceration of the urethra from dilatation.

In the discussion of the paper, Dr. Skene, of Brooklyn, deprecated the general use of Dr. Emmet's method of exploration in urethral affections, and characterized the operation as far from simple; disagreeable to the patient; not demanded in some of the conditions enumerated, and as inferior to the use of the endoscope in the detection of ulceration and fissure, the escaping blood obscuring the abnormal appearance. As a means for the removal of morbid growths, and the cure of prolapsus of the urethral mucous lining, he regarded the operation as of great value.

A paper on *The Proper Use of Ergot in Obstetrics*, by JOSEPH TABER JOHNSON, M.D., of Washington, D. C., is taken up with an examination into the effects of ergot in parturition; its failure to excite proper uterine

action; its destructive power over foetal life, and the danger of causing rupture of the uterus. He expresses his own opinion of the drug as follows:—

“I am free to say, that I think the human race would be better off if ergot should be utterly abolished from the lying-in room. I believe that, as at present employed, it does vastly more harm than good to parturient women and their unborn children. It certainly should never be given to a primipara. It would be safer to give it to no woman in labour; but in careful hands, when its powers are fully known and its dangers appreciated, it might perhaps be administered in the second stage with advantage to overcome uterine inertia, but only then in cases where the soft parts are relaxed, and we are quite certain, both from present appearances and the history of former labours, that the child will be born in a half or three-quarters of an hour. Even then, for the full protection of the child, frequent auscultation should be practised, and, upon its heart becoming slowed or enfeebled, it should at once be extracted with the forceps.”

“The use of ergot is contraindicated in retained placenta. It keeps up a state of painful contraction after natural labour, annoys and exhausts the patient needlessly, interferes with the normal discharge of the lochia, and perhaps aids in the causation of septicæmia.”

Dr. John P. Reynolds, of Boston, called attention to the hypodermic use of ergotine for the control of post-partum hemorrhage. He thought it good practice to administer ergot after delivery, to lessen the liability to after-pains, by the production of prompt and thorough uterine contraction; it was especially demanded after the long use of anæsthetics. He did not believe that ether, when properly used, predisposed to post-partum hemorrhage.

Dr. Fordyce Barker, of New York, used chloroform in his obstetric practice, and habitually administered ergot after the birth of the child. He thought it diminished the severity of after-pains, and promoted rapid involution; he was in the habit of using it where the woman was feeble, in the first few days of convalescence, in combination with stimulants, iron, and strychnia. In thirty-four years he rarely delivered a woman without anæsthetics, and had never in his own practice had a post-partum hemorrhage; he used chloroform; followed the expulsion by manual pressure, and gave ergot immediately after the expulsion of the placenta.

Dr. J. D. Trask, of Astoria, had had an opposite experience with chloroform, and had decided to abandon its use in cases of normal labour, confident that it favoured post-partum inertia and hemorrhage; he believed that sulphuric ether was less objectionable in this respect.

The Ovarian Cell; its Origin and Characteristics, by Dr. THOMAS M. DRYSDALE, of Philadelphia. In this monograph of thirty-two pages, he defends his position in regard to the diagnostic value of the ovarian cell, claiming that its existence will establish, whether a fluid is ovarian, ascitic, or parovarian. The author has had a large experience in examining fluids taken from the abdominal cavity or viscera, and certainly is able, as a general rule, to state to which of the three orders enumerated a fluid in question belongs. On one occasion Prof. D. Hayes Agnew gave him a fluid for examination, in which he found the characteristic cell. Upon stating what he had found to Dr. Agnew, he was told that the fluid had been taken from the abdominal cavity; upon which he immediately said that the fluid must have escaped from an ovarian cyst, for it was ovarian. In this he was correct, as the ovarian cyst had a small hole in it, as if made with a punch, and the fluid had escaped as claimed. Dr. Drysdale does not claim that there is no similar cell in any other mor-

bid fluid, but that it is not in any other intra-abdominal location except the ovary, after becoming diseased by cystic degeneration. His views have met with much opposition here and abroad, and others do not appear to have attained to the microscopic expertness claimed by him; but still he holds to the belief, that there is a pathognomonic granular cell indicative of ovarian disease, the only exceptional instance in two thousand cases having been found in the fluid contents of a renal cyst.

Mr. Thornton, of London, Eng., claimed that the so-called cell was only a "nucleus of a rapidly degenerating cell of the cyst membrane." Dr. Drysdale in reply reiterated his opinion, and gave the names of several leading physiologists who had agreed with him.

Treatment of the Pedicle in Ovariectomy is the title of a paper, by Dr. R. STANSBURY SUTTON, of Pittsburgh, Penna. This eleven page monograph is a condensed historical sketch of the operation and the method of treating the pedicle, from the earliest cases down to the time when it was written. The author says in a few words: "It has been tied entire, tied in sections, been twisted off, burnt off, crushed off, cut square off, cut off in flaps, left inside, left outside, and been made to slough off." He shows that the pedicle was at first treated very much as it is now, with the exception, that from 1809 to 1821 the ligature was not cut off, but was brought out through the wound. In 1821 Dr. Nathan Smith inaugurated the method of cutting off the ligature closely and dropping in the pedicle. In 1848, Stilling, of Cassel, introduced the extra-peritoneal method, which is now nearly abandoned except by Mr. Spencer Wells and a few others.

Dr. Sutton describes the operative methods, as he witnessed them, of Prof. Billroth, of Vienna, and Nussbaum, of Munich; Prof. Kuster, and Dr. Martin, of Berlin, Mr. Lawson Tait, Mr. Thornton, Dr. Bantock, Mr. Spencer Wells, Dr. Keith, Dr. Savage, of Birmingham, and Profs. Langenbeck, Shröder, and Esmarch. The monograph is one of much interest because of the personal observations of the author.

In a paper on *Care of the Perineum*, Dr. THEOPHILUS PARVIN, of Indianapolis, now of Philadelphia, describes all the methods known to the profession which have been recommended for the prevention of rupture of the perineum during parturition, and accounts for the frequency of the accident, as due to the formation of the pelvis and soft parts, relative size of the fœtus, use of the forceps, precipitate delivery, employment of ergot, etc. In regard to what he considers the most common of all these, he says: "The great majority of perineal lacerations are caused by precipitate deliveries, force too great, time too short, the expelling power overcoming the resisting part not by stretching but by tearing." This being the case, he recommends a line of practice designed to prevent the too rapid expulsion of the head of the fœtus, and to promote the gradual enlargement of the vulvar outlet. With this view he prefers the lateral decubitus of the patient, cautions her against making expulsive efforts, uses an anæsthetic where she will not control her passion for bearing down, holds back the head by supporting the perineum, and continues this support until the shoulders are delivered. As supporting the perineum has by many been condemned, we give the author's own words: "Supporting the perineum is strengthening the weak part of an elastic ring, and relieving it of excessive strain. The hand should be applied directly, and with no intervention of napkin; support is given only at the close of the second stage, and only during a pain. Supposing the patient to be lying on her left

side, and with her hips near the edge of the bed, the practitioner applies his right hand so that the concave palm receives the convexity caused by the bulging perineum, the thumb is on the right, the four fingers upon the labium majus, while the fold between the thumb and index finger corresponds with the anterior margin of the perineum. Great pressure is avoided, lest a thinned part of the perineum may rupture, but moderate resistance made to the driving force, and at the same time the head is gently pressed toward the pubic symphysis."

The operation of incising the perineum to avoid rupture, Dr. Parvin has traced back to 1742, when Ould recommended it in his *Treatise on Midwifery*. He is opposed to the introduction of the fingers into the rectum to aid in the delivery, which is also an old method, as old as the work of Gardien, of Paris, who objected to the method.

We think there are decided objections to supporting the perineum with the bare hand, as recommended. The reviewer prefers to have the orifice of the bowel occluded by a napkin, so as not to receive the contents of the rectum in his hand; and, besides, this is more agreeable to the patient. The napkin need not prevent the operator from feeling what is taking place in the distended parts. As it has been ascertained that a large proportion of lacerations result from the delivery of the shoulders, Dr. Parvin recommends to deliver the pubic shoulder first, and thus diminish the width of the thorax and the risk in delivering the other.

The Relative Value of Hysterectomy and of the Complete Removal of the Uterine Appendages for the Cure of Uterine Fibroids, is the title of a paper by J. KNOWSLEY THORNTON, M.B.C.M., of London. Although the relative mortality in Europe after hysterectomy for uterine fibroids has been less than in this country, the death-rate has been such as to make it desirable to avoid the operation wherever possible, and to substitute for it a less fatal, and, in general, an equally efficient one, *i. e.*, the removal of the ovaries and the enlarged bloodvessels leading to them, in which are also involved the Fallopian tubes. Mr. Thornton gives a table of 221 hysterectomies, performed by ten operators, nine of them Europeans, which resulted in 131 recoveries and 90 deaths. Of this record, Mr. Spencer Wells is credited with 39 cases, Mr. Thornton 25, and Dr. Bantock 21, in all 85, with 35 deaths, or 40.70 per cent. Of these, there were in all 22 cases operated upon for fibro-cysts of the uterus, with 17 recoveries and 5 deaths, a loss of 22.72 per cent. In contrast with these results, he gives the following as the diminished mortality under the substitute of Battey: "Tait, 38 cases, 33 recoveries, 5 deaths; Savage, 14 cases, 14 recoveries, no deaths; Thornton, 8 cases, 8 recoveries, no deaths; total, 60 cases, 55 recoveries, 5 deaths; mortality 8.16 per cent."

In the discussion of the paper, Dr. Goodell stated his preference for enucleation, which he had performed successfully a number of times, to the removal of the uterus. Of four oöphorectomies for fibroid tumours, two had proved fatal; all having been performed in a general hospital. He preferred this operation to hysterectomy, which had been so fatal in this country. In his experience, also, exploratory incisions in cases of large fibroid and fibro-cystic tumours had proved dangerous to life.

Dr. T. G. Thomas had removed the uterus for solid or fibro-cystic tumours in 13 cases, with 7 recoveries. He gave it as his opinion, that one-fourth of all Anglo-Saxon women (*i. e.*, above 40 years of age) have fibroid tumours of the uterus. Klob claimed as high as 40 per cent. from

his *post-mortem* investigations. Among the coloured women of this country the rate is believed to be fully this. Dr. Thomas also expressed a decided preference for enucleation over hysterectomy in the cases where it is practicable. He recommended the use of the curette for controlling the uterine hemorrhage dependent upon the existence of large tumours, and also called attention to the fact, that in some such cases the real cause of hemorrhage existed in a removable growth within the uterine cavity, and not in the more noticeable fibroid.

Electricity in Extra-Uterine Pregnancy. HENRY J. GARRIGUES, M.D., of New York, was led to prepare this valuable paper for two reasons: 1. He noticed that, notwithstanding the attention that had been drawn to this subject in the United States, and the successful treatment of the cases, quite a number of writers in Europe appeared to be still in ignorance of the value of electricity as a fœticial expedient, and of the safety with which it could be used in the early period of extra-uterine pregnancies. 2. He had additional evidence of its value in the fact that he had operated with success in his own practice.

Dr. Garrigues gives the records of eleven cases including his own, in which electricity has been used for the destruction of the fœtus in tubal pregnancies, as follows, which, for brevity, we have here presented under a tabular arrangement, condensed from his abstract reports:—

| No. | Name of operator. | Locality. | Year. | Age of woman. | Number of pregnancy. | Estimated duration of pregnancy. | No. of treatments. | Result to woman. | Special notice. |
|-----|------------------------|--------------|-------|---------------|----------------------|----------------------------------|--------------------|------------------|-----------------------------|
| 1 | Dr. Baccetti | Pisa, Italy | 1853 | 29 | 4-para | In 3d mo. | Once | Recov. | Cyst punctured per vaginam. |
| 2 | Dr. Braxton Hicks | London | 1866 | 35 | 3-para | 3½ mos. | Twice | Died | |
| 3 | Dr. Joshua G. Allen | Philadelphia | 1869 | ? | Pluripara | In 4th mo. | Several | Recov. | |
| 4 | Drs. Loving and Landis | Columbus, O. | 1872 | ? | Pluripara | 3 months | Eight | " | |
| 5 | Dr. McBurney | New York | 1878 | 21 | 1-para | 2 mos. 3½ weeks | Twice | " | Same as No. 4. |
| 6 | Dr. J. C. Reeve. | Dayton, O. | 1879 | 25 | 2-para | 3 months | 8 or 9 | " | |
| 7 | Dr. L. C. Billington | New York | 1880 | 34 | 2-para | End of 3d month. | 4 times | " | |
| 8 | Dr. W. T. Lusk | " | 1880 | 28 | 2-para | 2 months | Several | " | |
| 9 | Dr. Bache Emmet | " | 1881 | 28 | 1-para | 3½ " | Three | " | Same as No. 4. |
| 10 | Dr. Henry G. Landis | Columbus, O. | 1881 | ? | Pluripara | 3 " | Six | " | |
| 11 | Dr. Henry J. Garrigues | New York | 1882 | 19 | 1-para | 2 " | Ten | " | |

Dr. Garrigues says of his method: "I used a French one-cell apparatus, composed of two carbon plates, and one zinc plate, immersed in Bunsen's battery fluid (potass. bichrom. $\frac{3}{4}$ ij; acid. sulphuric. concentr. f $\frac{3}{4}$ iss; aquæ fluv. f $\frac{3}{4}$ xj). The positive electrode, made of a large carbon plate, covered with cloth, was applied on the abdomen, over the tumour. The negative electrode, consisting of one isolated brass stem, with knob, was introduced into the vagina, and pressed up against the lower part of the tumour. The current was gradually increased to the limit of her endurance, but never enough to cause real pain." Two days later, the pulsation of the tumour, previously felt in the vagina, had disappeared, and the tumour was less in size. The applications were made, of about ten minutes' duration each, and were continued, almost daily, for two weeks. In sixteen days, the tumour had gone down to the size of an English walnut.

T. GAILLARD THOMAS, M.D., of New York, presents *The History of Twenty-one Cases of Extra-Uterine Pregnancy coming under the personal observation of the Writer.* Of these cases three occurred in Dr.

Thomas's own practice, and eighteen were seen in consultation. Nos. 16, 17, 18, and 19 are the same cases as 5, 7, 8, and 9 in the table prepared from the record of Dr. Garrigues. Nos. 15 and 21 were also treated successfully by electricity. There were thirteen recoveries and eight deaths in the cases. Rupture of the sac occurred in five cases, with four deaths. Laparotomy was performed in three cases; all recovered. In two the cysts were tapped; both died. One cyst was incised per vaginam by the thermo-cautery knife, with recovery, and one was evacuated per rectum, but the patient died. In two, spontaneous evacuation by the rectum occurred, and they recovered.

In the discussion Dr. Wilson, of Baltimore, reported two cases, with one recovery; Dr. Howard three cases, all fatal; and Dr. Goodell, of Philadelphia, thirteen cases, with three recoveries. A very large number of cases might readily be added to these.

The Influence of the Constant Use of High-heeled French Shoes upon the Health and Form of the Female, and upon the Relation of the Female Organs. After some historical remarks upon the shoe, commencing with its earliest form, SAMUEL C. BUSEY, M.D., of Washington, D. C., in a paper of eighteen pages, endeavours to prove that the wearing of the French high-heeled shoe by American women alters the direction of their ankle, knee, and hip-joints, the obliquity of their pelvis, and the line of their spinal columns; and tends to produce muscular fatigue, to interfere with taking proper exercise, and to induce displacement and disease in the pelvic viscera.

Drs. Barker and Thomas, of New York, whilst commending the theories of Dr. Busey, were compelled from a large experience with the cases of fashionable women to admit, that what might be expected to follow the wearing of high-heeled shoes was not observable in the walk, carriage, and contour of the wearers. They were inclined to attribute the diseases of the pelvic viscera to innate or other causes. Dr. Busey had taken a series of photographs to illustrate the effect of the shoe upon the line of the body and lower extremities, but these were not used in the publication of his paper because of some errors in their preparation. From our own observations we are inclined to believe that the chief injuries produced by the high heel are located in the ankle-joint, tarsal bones, metatarsophalangeal articulation of the great toe, and the tendons, which are compelled to move the foot in an unnatural position.

Mechanical Therapeutics of Versions and Flexions of the Uterus, by ELY VAN DE WARKER, M.D., of Syracuse, N. Y. This article, covering with its illustrations some sixty pages, in which are presented the numerous forms of pessaries invented by gynecologists, cannot be given in abstract, but must be examined to be understood and appreciated. A glance at its armamentarium is sufficient to demonstrate that with all the contrivances in use, there is still a great difficulty in overcoming abnormal forms and positions of the uterus by mechanical means; the location of the organ, its relations with the rectum, bladder, and abdominal viscera, and its imperfect support, making any appliance more or less imperfect in its action as a rectifier of form or position.

Dr. Van de Warker classifies the version and flexion pessaries in use under three groups and eleven classes. The three groups are: 1. Pessaries, with external support. 2. Pessaries acting within the vagina. 3. Intra-uterine stems. The paper is one of great labour and research, and its illustrations are a museum of pessaries and stem supports.

J. COLLINS WARREN, M.D., of Boston, contributes a paper entitled *A New Method of Operation for the Relief of Rupture of the Perineum through the Sphincter and Rectum*. The object of the plan of operation devised by Dr. Warren is to shield the rectal portion of the rent after its closure, so that no fecal matter can come in contact with the cicatrizing edges. This is accomplished by preserving the thin portion of cicatricial tissue, which is dissected off in the denudation of the lips of the rent, in an entire state, and turning it down and into the rectum, so that what is vaginal surface shall become a portion of the lining of the bowel thrown up in a fold over the stitched wound. When the denuded surfaces are brought into contact and secured by wire sutures, the turned-down flap is to be folded as a ridge in the rectum, and the projecting part cut off, but not too short, and the raw edges stitched together. As the wound heals the flap retracts, and finally leaves little or no recognizable ridge in the rectum.

Dr. Warren keeps the bowels inactive for a number of days after operating, and to escape having caseous concretions in the rectum, and the consequent difficulty of defecation, avoids the use of milk as a diet, and substitutes for it beef-tea and other liquid dietetic preparations.

Dr. MATTHEW D. MANN, of Buffalo, N. Y., in a paper of very great interest, entitled *Surgical Operations on the Pelvic Organs of Pregnant Women*, presented a number of facts based upon the experience of a large number of American and European writers and gynecologists. The whole range of the operations in question has been thoroughly examined, and their effects as factors in the production of abortion noted. It was at one time thought hazardous even to pull a tooth for a pregnant woman, and we have no doubt that this opinion originated in an actual case; but we have become wiser, and do not hesitate to extract teeth; and have but little fear from the effects of much more serious operations. The conclusions of the author, which are based upon the facts elicited, are as follows:—

“1. Pregnancy is not so decidedly a bar to operations on the pelvic organs as is generally supposed. The results, however, vary with the operation and the organ operated upon.”

“2. Union of denuded surfaces is the rule, and the cicatricial tissue formed during the earlier months of pregnancy is strong enough to resist the shock of labour at term.”

“3. *Operations on the vulva* involve very little danger either to mother or child.”

“4. *Operations on the vagina* are likely to cause severe hemorrhages, but are not otherwise dangerous.”

“5. Venereal warts and vegetations of large size and non-syphilitic are best treated by removal, whether they occur in the vagina or are confined to the vulva.”

“6. Applications of nitrate of silver and astringents of this class may be made with safety to the vagina and cervix. Diffusible poisons, like carbolic acid and iodine, should not be used pure or in strong solutions for such applications.”

“7. *Operations upon the bladder and urethra* are not dangerous, or likely to be followed by abortion.”

“8. *Operations on the rectum* involving the sphincter ani, even if slight in their character, are dangerous.”

“9. *The operation for vesico-vaginal fistula* should not be undertaken during pregnancy, as the dangers of hemorrhage and abortion are considerable.”

“10. *Plastic operations on the cervix and perineum* may, if necessary, be undertaken in the earlier months of pregnancy with a fair prospect of success, and with a good chance that the results may not be impaired by labour.”

"11. Small polypi of the cervix may best be treated by torsion or strong astringents. If cut, there is some danger of abortion following."

"12. Large polypi may, if causing hemorrhage, be removed at once, with a fair chance of good results. If not doing any harm, their removal is best left until near the close of pregnancy."

"13. Cancer of the cervix discovered during pregnancy should, if possible, be removed at once."

These opinions are based upon the results of ninety operations, causing twenty abortions and four deaths. Thirteen of the twenty abortions were produced by thirty-four operations on the rectum, anus, perineum, and cervix, with two of the deaths.

It must be borne in mind, that the uterus is much more readily excited to expel its contained ovum in some women than in others, a mere trifle being enough in some cases to excite an abortion. The reviewer had a patient of fine physique whose disgust for caterpillars was such, that she miscarried twice through their getting upon her. Once, the unexpected fall of one from a tree upon her bare head caused an immediate uterine action resulting in her having a miscarriage within a few hours.

In a paper entitled, *Hyperemia of the Vesico-Urethral Membrane*, Dr. W. H. BAKER, of Boston, describes the diseased condition he proposes to consider thus:—

"The cases of vesico-urethral hyperemia to which I would limit the considerations of this paper, are those where the mucous membrane of the bladder and the urethra being perfectly healthy, except at the point of their junction, there exist at this last-mentioned site a few tortuous bloodvessels running over an otherwise healthy membrane. These bloodvessels are evidently veins, as the most careful examination fails to discover in them the least pulsation. It seems almost incredible that so slight a deviation from a normal condition should create so great a disturbance to the nervous system, and cause so much local pain as I have seen present."

After determining the existence of this diseased condition by the use of Skene's endoscope, and failing to produce a cure by local applications, Dr. Baker opens the bladder as for the treatment of cystitis, making a vesico-vaginal fistula, so that no urine shall pass through the urethra until it is restored to its normal condition. He next directs the patient to inject the bladder with water at 105° to 110° from a fountain syringe to which is fitted a small straight nozzle of metal or hard rubber, a quarter of an inch shorter than the urethra. This is used freely every day for two or three weeks, when a little alum, tannin, or zinc, is added to the water. Four to six months of this treatment are required to cure the hyperemia in some cases, the fistula being kept open by the daily passage of the index finger of the patient. When the disease is removed the fistula is to be closed by an operation. During the period of leaking, the patient is to wear either an external urinal, or one fitted in the vagina to the fistula, so as to receive the dribbling urine. Five clinical records showing management and cures are given.

R. P. H.

ART. XX.—*Studies in Pathological Anatomy.* By FRANCIS DELA-FIELD, M. D., Adjunct Professor of Pathology and Practical Medicine; Visiting Physician and Curator to Bellevue Hospital; Visiting Physician and Pathologist to the Roosevelt Hospital. Vol. I. Plates I.-XCIII. pp. 110. New York: William Wood & Company, 1882.

THE portion before us constitutes only the first volume of Dr. Dela-field's work, and therefore it is not our purpose to discuss critically the matter which he has given us; reserving the consideration until his "*studies*" are complete.

When the announcement of the work was made, and the first part was received nearly five years ago (No. I., February, 1878), we were much pleased to learn that a serious effort was to be made, by one so very well qualified to give to the medical world the results of the labours in the direction of Pathological Anatomy of which America to day is by no means a meagre contributor.

The author's prefatory note to the first paper stated that the particular subjects of study "will be the inflammations of the connective tissue, of the mucous membranes and of the viscera, and the structure of tumours." This volume is devoted to the consideration of connective tissue, the pleura, the peritoneum, and certain diseases of the lungs, pneumonia, miliary tuberculosis, and acute and chronic phthisis. The conclusions at which he has arrived from his studies, in respect to connective tissue, are the duplicate of the views now generally in vogue among most authors, many of whom are quoted for their support. The various forms of inflammation are classified under seven heads, and these seven "names" are clearly defined. We do not suppose the author intends us to believe that all of these seven are different kinds of inflammation, since at least some of them are merely convenient designations of a predominating element in the inflammatory matter, dependent in most cases, perhaps, on the rate of progress of the inflammatory changes rather than on differences of the causation, or of the nature of the morbid factors. There are given three plates illustrating the appearances of normal connective tissue.

In studying the structure of the pleura we are glad to see that stress is laid on the fact the membrane, so called, is not distinct from the tissues beneath, but a layer of connective tissue continuous with these tissues. "It would be difficult for the lungs to be constructed at all without some such smooth external surface." We are sorry, however, to see that he lends countenance to the mistaken view by afterwards speaking of "cells, usually called endothelial cells." Even if no theory is implied by the term, there is no word without which we would be better off than endothelium. It was conceived in error, and leads only to mistake and confusion. In this portion are given five plates.

The study of the inflammations of the pleura follows, described under seven headings, all of which (if we exclude the tubercular) are in reality clinical types rather than pathological or histological, and for which it would seem that distinctive clinical features for their recognition are not forthcoming.

The description of the changes of the peritoneum is illustrated by eleven plates, one of which is devoted to tubercular peritonitis.

Pneumonia comes next, and in speaking of the anatomy of the lung he says, that "in foetal life the air-vesicles are lined with cylindrical cells re-

sembling the epithelium of the bronchi;" afterwards he describes the changes through which these air-vesicle cells pass to arrive at the flattened condition in which we see them in the adult lung. He speaks of the adult air-vesicle as "this connective tissue membrane," "an arrangement of tissues designed for the performance of a special function," and says "it can serve no good purpose to compare them with either mucous or serous membranes. They are simply air-vesicles, and nothing else."

This expression of opinion on the minute anatomy of the air-vesicles of the lung cannot, we think, be too severely criticized. The struggle through which this question passed before the true relationship of the parts became recognized, was too severe for us now to slip back to the older view. The struggle was even more severe in the pathologico-anatomical aspect of the question before the fact was recognized that the bronchial mucous membrane passed, as we may say, by insensible gradations into a differently constructed or arranged mucous epithelium lining the air-vesicle cavities. The older view that bronchial inflammation ended with the tubes and never invaded the air-vesicle, because the lining membranes of the respective parts were anatomically dissimilar, is one which we have learned to regard as obsolete.

The greatest advance which has been made in the last twenty-five years in the study of diseases of the lung, came from a proper recognition or discovery of just this fact in the normal anatomy of the organ. In truth, no improvement in pathological anatomy can be made until a full and just knowledge is acquired of the embryological or histogenetic relation of the tissues of an organ. Once having acquired this knowledge, it is most unfortunate on the part of the author to thus slurringly disregard it. On the facts of this anatomical structure depend our means of the proper study of lung diseases.

The author goes on to say: "It is customary to class all these inflammatory processes which involve the air-vesicles and interstitial tissue of the lung under the name of pneumonia. It is also customary to subdivide pneumonia into the anatomical varieties of catarrhal, croupous, and interstitial pneumonia. To the name interstitial pneumonia there can be no objection; to the names of catarrhal and croupous pneumonia there are very serious ones. They are the result of comparing the air-vesicles with mucous membranes, structures from which they are entirely distinct."

It is to this latter statement that we must take entire exception—it is so completely opposed to the correct anatomical view of the structure of the pulmonary organs.

The author describes the forms of pneumonia under six different heads, as follows: 1. The pneumonia of heart disease; 2. The lobar pneumonia of adults and children; 3. The lobular pneumonia of adults and children; 4. Interstitial pneumonia; 5. The pneumonia produced by pressure on the trachea or bronchi; 6. The lesions of acute tuberculosis, and of acute and chronic pulmonary phthisis.

A glance at this classification shows at once that the aim in distinguishing these different forms is to arrive at an etiological or perhaps a clinical basis for the study of pneumonia. While, perchance, such an aim is praiseworthy, and at least useful in a therapeutic point of view, it strikes one as strange to meet with it in a volume devoted solely to the aspect of pathological histology.

Pathological anatomy is unfortunately often compelled by the nature of the case to vary its classification of the morbid changes from the purely

clinical method of consideration. It is forced to this variation in some cases through our lack of knowledge of the symptoms which result from the morbid changes. But that an author should take what is apparently a step backward and select as a basis of classification the etiological varieties of disease which does not correspond to the accepted clinical method of its study seems to be unfortunate.

What the author designates as the pneumonia of heart disease is commonly known as brown or pigment induration, described by Virchow in 1847. The author differs in many points with Virchow, as have others, in the description of the condition of the lungs. Delafield says that the lungs are usually small, except when changed through emphysema; the lungs are dry, not yielding a coloured serum on section, as described by Virchow. The author speaks of an hepatization involving portions of the different lobes or an entire lobe. The designation of the consolidation more or less complete, which is sometimes seen as a hepatization, is not concurred in by others, and judging by the description given it is difficult to class the condition among any of the recognized true hepatizations. Doubtless considerable areas of the lung are oftentimes non-crepitant, airless; brought about by a variety of conditions or a combination of several. Partial collapse is frequent; œdema is a well-recognized condition in obstructive valvular disease; then, too, such lungs most frequently show a chronic catarrh of the bronchial mucous membrane. Partial collapse with an accumulation of the catarrhal products in the air-vesicles seems to correspond pretty closely with the "perfectly smooth hepatization not resembling that of acute lobar pneumonia," of which Delafield speaks. He describes "four separate pathological conditions existing," by which expression is probably meant changes in four different tissues. Of these he lays the most stress on the first, the hypertrophy of the capillaries and his view of this matter is peculiar and, we believe, original. In some lungs, he says, the capillaries are both dilated and increased in length, tortuous, and projecting into the air-vesicles; in other cases they can hardly be said to be dilated at all (he does not say whether they are tortuous or not), and between the two extremes we find every gradation. Artificial injection in all cases requires increased pressure. He then goes on to say that the mechanism does not seem as simple as heretofore considered, viz., that the obstructed valvular orifices produce blood stasis and consequent capillary dilatation, but that there exists another force impeding the blood flow. He says "there does not seem to be necessarily any real accumulation of blood in the lungs, but rather a retardation of the circulation. The lungs do not at any one time contain more blood than do normal lungs—if we can judge from post-mortem appearances, they may contain less—but the blood passes through them more slowly than it should. If this view be correct, then the large size of the capillaries depends, not upon their dilatation by the pressure of the blood, but upon a hypertrophy of their walls. The increased size of the capillaries as well as the other lesions yet to be described, are due to a change in the nutrition of the lungs produced by the slow circulation of the blood through them, and these changes may fairly be classed with other chronic inflammations."

This description and the reasonings from it do not seem quite satisfactory. Of course, if the capillaries are dilated and tortuous, as they certainly are in the larger number of such lungs, there must be more room for the blood in the lung, and consequently more blood. Tortuous capil-

laries furnish, in addition to the narrowed mitral orifice, another cause for the retardation of the blood-current, but in no manner do they lessen the amount of blood actually present at any one time in the lung. On section of such lung we have seen less blood flow from the cut than usual, but the microscope has shown us that an ante-mortem coagulation had occurred in the capillaries, probably during the prolonged agony produced by the great and increasing retardation. It is difficult to understand how the large size of the capillaries can depend upon a hypertrophy of their walls, or what effect this change would have in retarding the blood. The large size spoken of by other authors refers to an increase in the capillary's lumen, and not a thickening of the wall. We do not see many conditions of disease in which the capillaries are thickened or "hypertrophied." We see the intertubular connective tissue thicken around the capillaries in *Stauungshyperämie* of the kidney from valvular heart disease cases, but the capillary walls do not themselves thicken or become hypertrophied. Even supposing an hypertrophy of the lung capillary walls, the author does not show how this condition would produce hindrance to the onward flow of blood further than those usually recognized. Hypertrophied arterial walls may oppose a force equal to the retardation of the blood-current by the spasmodic contraction of their muscular coat, but in these capillaries we are not concerned with a muscular hypertrophy or any such spasmodic closure of their lumina; it has to do entirely, if it exists, with a thickening due to change of nutrition, if you will, of an inflammatory nature. Such an inflammatory thickening cannot cause retardation of the blood unless it narrows the lumen below the normal, and this condition of reduced size is not mentioned by Delafield. In classing these changes with other chronic inflammations, one, perhaps, may be allowed some freedom of choice, since it is so difficult to draw the line of demarcation between changes due to increased nutritive changes (hyperplasia) and those of the grade of low chronic inflammations. We may, however, note in this connection that the latter are so constantly followed by contractile changes (cicatrical tissue) that we are often enabled thereby to make a distinction. In this condition of the lung they have not been described by any one, and hence Rokitansky's view of their chronic inflammatory character has been most generally denied. The other conditions require no special comment.

Of lobar and of lobular (respectively croupous and catarrhal) pneumonia the author gives the usually accepted interpretation, modified, of course, by the peculiar view which he holds, as explained above, in respect to the normal anatomy of the parts. There are four plates devoted to each of these forms of pneumonia. In the first picture of lobar pneumonia, red hepatization (Pl. 33), the author gives the appearance of the fibrin forming an irregular meshwork as it has been usually represented by other authors. We confess never to have been able to find the fibrin arranged in this manner in the red hepatization of croupous pneumonia. It always presents itself, with the entangled cellular and corpuscular elements, arranged in groups of straight lines, so that the cells, stained red with carmine, appear to be strung along it like rows of beads. This appearance we have always held of value in determining the period of advancement of this stage. Early in the stage the fibrin lines are very distinct, straight and rigid, while towards the advent of the gray stage with catarrhal changes the straightness of the lines is lost or obscured by the new inflammatory elements. We have accounted for the loss of rigidity by

the softening and breaking down of the fibrin-threads. It has always seemed to us a point of great microscopic diagnostic value.

The author devotes the succeeding ten plates and ten pages of accompanying letterpress to the subject of *Acute Miliary Tuberculosis*. He distinguishes four principal kinds of miliary tubercles in the lungs: 1. Miliary tubercles composed entirely of amorphous granular matter, with a few shrunken cells, and an external zone of pus-cells. They cannot be said to have a definite anatomical structure. 2. Tubercles composed principally of new tissue, which apparently replaces the parenchyma of the lung, while at the periphery of this nodule of new tissue are air-vesicles filled with cells. 3. Miliary tubercles, composed partly of solid tissue, partly of air-vesicles filled with tubercle tissue, partly of air-vesicles filled with epithelium, pus, and fibrin. 4. Those which consist simply of infiltrations of the walls of air-vesicles, of bronchi, of bloodvessels, and of lymphatics. Of these varieties he says "that the bodies do not all have the same structure, so that this name does not designate any definite anatomical tissue. In the larger number of miliary tubercles, however, we do find a tissue of a particular kind, which is found nowhere else, a tissue composed of polygonal and giant cells imbedded in a basement substance. This tissue, as being the only anatomical characteristic of tubercle, we may call tubercle tissue; and, according to the arrangement of its elements, we may divide it into tubercle granula and diffuse tubercle. This, however, brings us to the somewhat curious conclusion that some tubercles are formed only of tubercle tissue, some of tubercle tissue and ordinary products of inflammation, some of cells resembling those of tubercle tissue, but not regularly arranged in a basement substance, while some contain no tubercle tissue at all." Is this curious conclusion justified? If we are to follow the author's guidance, it would seem not, since he requires of a tissue that to be tubercle it shall contain "polygonal and giant-cells imbedded in a basement substance." We think, however, that the conclusion is correct, while the test of tubercle tissue is faulty. It is not improbable that the author's letterpress was penned when the then fashionable test of tubercle was the presence or absence of giant-cells. Doubtless it would be formulated differently by him now. After all, when we reflect on the appearances of other morbid tissues or growths, is not the dissimilarity often as great as in tubercle. For example, carcinoma of the lung, especially when secondary; do we not often find it mingled with inflammatory tissue, or with its cells not regularly arranged, or even with masses of cells quite indifferent in character, about which we have the inner consciousness that they would develop into typically arranged cells?

The author next takes up the subject of *Chronic Pulmonary Phthisis*, and devotes fourteen plates, several of which are superb, double-page drawings, with twelve pages of description of them. He states first the three principal current theories of the nature of pulmonary phthisis: first, the older German theory of inflammatory phthisis which can be distinguished from a tubercular phthisis; secondly, the modern French theory that all phthisis is tubercle; and thirdly, the later German teachings which deny that there is any characteristic lesion at all belonging to phthisis, and holds that the only test is their inoculability. Added to this theory is the belief that a specific form of bacteria is the exciting cause of the productions of tubercles.

The changes in the lung which are figured in these plates are: 1, The miliary tubercles scattered singly through the lungs; and 2, the same

joined together by diffuse fibrous tissue or accompanied by the presence of large masses of the same fibrous-looking tissue. The first of these conditions is found in subjects of emphysema and chronic bronchitis, and although the tubercles are numerous and often exist in other organs than the lungs, it is curious that there are no such marked and fatal symptoms as exist in acute miliary tuberculosis. The diffuse masses correspond to what has been by others described as fibrous phthisis, *i. e.*, an interstitial pneumonia. The author believes that "such a fibrous phthisis is nothing but an old tubercular phthisis."

The final chapter of the volume is on *Acute Phthisis*. The conditions are divided for purposes of description into two classes: 1, the diffuse hepatization; and 2, the white or yellow nodules. Their discussion is preceded by a description of the normal anatomy of the small bronchi and air-vesicles, which are illustrated by two plates. Following the description of the morbid appearances in these two classes, he passes to the lesions of the bronchi and acute phthisis, of which four plates are given. In the last pages of this chapter is given a description of the distinction between cheesy degeneration or metamorphosis, and coagulation-necrosis and the relative parts which they play in the destruction of the lung. He alludes also to the distinction between the "tubercles massifs" and the areas of coagulation-necrosis with which they have sometimes been confounded.

Many readers may find that some of the tissues present to their eyes different appearances from those here pictured, or they may wish to give a different interpretation from the author, but all will appreciate the superb character of the drawings. None can fail to recognize the fact that the author has engaged in the work of drawing and describing what has actually been seen. It is his own observation and delineation—not fancy sketches to support his theories. We shall all wait anxiously for the succeeding volume.

M. L.

ART. XXI.—*The Field of Disease. A Book of Preventive Medicine.*

By BENJAMIN WARD RICHARDSON, M.D., LL.D., F.R.S., Fellow of the Royal College of Physicians, etc. 8vo. pp. 737. Philadelphia: Henry C. Lea's Son & Co., 1884.

THE progress made in recent years within the sphere of preventive medicine and allied branches of medical science has opened up a wide and fruitful field for cultivation by teachers and writers on these prolific subjects. We were glad to hear the announcement that Dr. Richardson had allotted to himself the task of garnering this fertile field, satisfied in the belief that should he devote his energies, knowledge, and facile pen to this great undertaking, the results would be deserving of the highest praise. We are not disappointed in the production of this elaborate treatise on preventive medicine, which is a vast storehouse of information gathered from the best sources, skilfully prepared, and systematically and logically arranged.

As remarked by the author in his preface, the work has been written "for those members of the intelligent reading public who, without desiring to trench on the province of the physician and surgeon, or to dabble

in the science and art of medical treatment of disease, wish to know the leading facts about the diseases of the human family, their causes and prevention."

Inspired with this object, Dr. Richardson has succeeded in producing a work which is elevated in conception, comprehensive in scope, scientific in character, systematic in arrangement, and which is written in a clear, concise, and pleasant manner. The leading design of the author is "to bring the preventive part of medical science into entire accord with the remedial; to let the world at large understand the interrelationships which exist between the two parts; and, by a sympathy of action, based on knowledge, to enable every man and woman to assist in that part which tends towards prevention."

The somewhat novel arrangement has been adopted of dividing the work into books. Book the First treats of General Diseases affecting Mankind, Local Diseases, and Diseases from Natural Accidents. Book the Second embraces the Consideration of Acquired Diseases from Inorganic and Organic Poisons, Acquired Diseases from Physical Agencies, Mechanical and General, and Acquired Diseases from Mental Agencies, Moral, Emotional, and Habitual. Book the Third includes the Origins and Causes of Disease and a Practical Summary of the Preventions of Disease.

Assuming that "the art of prevention is based upon the art of learning the antecedents of the phenomena of disease and the reasons why diseases are developed at all," it is strictly logical and indispensable to first describe the various diseases which afflict humanity, showing their origins and causes, in order to intelligently discuss the ultimate end in view, the prevention of disease.

In describing these affections the classification of the Royal College of Physicians has been taken as a general basis and direction. As a preliminary study, essential to a clear understanding of what follows, a chapter has been devoted to a brief exposition of certain terms which are in common use for expressing what have been called the attendant conditions of disease, such as fever, irritation, inflammation, etc. The main subject opens with a concise summary of general diseases running a definite course, the great plagues of the earth, such as smallpox, scarlet fever, typhus fever, cholera, etc. These are the principal diseases of the so-called zymotic class, which are so destructive of life, and whose consideration forms so important a part of the science and art of preventive medicine. General diseases of a constitutional type are next described. These are diseases which "for the most part are apt to invade different parts of the same body simultaneously or in succession. They are sometimes spoken of as constitutional diseases, and they often manifest a tendency to transmission by inheritance." Rheumatism, gout, cancer, and scrofula may be mentioned as examples of these types of disease. This completes the study of the general diseases. The importance of a thorough acquaintance with these affections should not be underestimated in view of the fact affirmed by the author, that, "if by preventive art we could control the comparatively small number of conditions and affections which have been detailed in the last three chapters, we could control the local diseases as well as general, and could prevent the whole, with the exception, always, of that final process of decay which forms the prelude to natural death from ripe old age."

The second part of Book First contains a description of local diseases,

while the third and last part refers to diseases from natural accidents. The list of local affections is a long one, and covers two hundred and four pages of the volume. The design of the author to write a work for the intelligent reading public makes unavoidable the introduction of so much matter with which the physician is expected to be already familiar. The arrangement and description of these various topics have been wisely adapted to the mission of the work. The language is clear and concise, the tone elevated. The reputation of the book has been carefully guarded by avoiding all reference to remedies, receipts, or nostrums.

A brief physiological outline of the systems of organs of the body has been prefixed to the analytical review of local diseases, in order to render the survey more intelligible.

The final part of Book First contains, in compact form, much interesting information upon diseases from natural accidents. These have been divided into several classes: I. Accidents which are purely mechanical. II. Accidents which arise from poisonous substances developed within the body. III. Accidents from venomous organic substances. IV. Diseases from animal or vegetable substances, taken as foods. V. Accidents in the female, connected with pregnancy and labour.

Book the Second treats of acquired diseases, and forms one of the most valuable sections of the work. It occupies one hundred and eighty-eight pages, and is divided into three parts, arranged under the following heads: I. Diseases induced or acquired from Inorganic and Organic Poisons. II. Diseases induced or acquired from Physical Agencies, mechanical and general. III. Diseases induced or acquired from Mental Agencies, moral, emotional, and habitual. It will be observed that the classification here adopted, according to causes, is essentially different from that followed in treating of the history and phenomena of what have been called natural diseases, which, for obvious reasons, have been arranged according to the parts of the body in which they are manifested. This classification is strictly logical, and, in fact, is the only one that could, with propriety, be adopted in a work of this character. In most works on practical hygiene these diseases are more conveniently referred to under the heads of air, water, food, occupations, habits, etc., but such an arrangement would not be harmonious with the plan and design of this work.

In reviewing the diseases induced or acquired from inorganic poisons, both solid and vaporous or gaseous, the sources of the poisons are pointed out, and the uses which are made of them in the arts, the various ways in which they are liable to be brought in contact with the human body, the mode in which they act, and the symptoms and diseases which they produce, are all clearly presented in accordance with the latest and best information on these subjects.

The acquired diseases from organic poisons include many affections which result from the common vices of the age. Hashish, chloral, chloroform and ether, opium, tobacco, and other poisons, are fully commented upon in connection with the diseases they are liable to produce.

Acquired diseases from physical agencies are usually discussed under the head of diseases of occupation. They form a brief, but instructive section of the work. In the chapter upon acquired diseases from muscular overwork and strain, the dangers from excesses in athletic sports are carefully portrayed. Disease from muscular strain in mature life and from muscular strain induced by industrial occupations, and disease from long-continued pressure, are appropriately referred to in the same connection.

Acquired deformities and defects of the body, and acquired diseases from physical injuries, each occupy one chapter. The concluding chapter of the second part of the first book is devoted to a brief history of the more important surgical operations. Though performed under necessity, they are, in a certain sense, induced injuries to the body, and therefore deserve notice in these pages. In the same connection, the subject of general anaesthesia, in relation to disease and mortality, is also considered.

The third part of Book Second, upon acquired diseases from mental agencies, moral, emotional, and habitual, supplies wholesome reading upon topics which are too frequently dismissed with only a passing notice. Diseases of this class are on the increase. They are, in a measure, the outcome of the struggles of life under a higher civilization. The need for the study of the connection of mental agency with the production of physical disease "has never been so decided as at the present hour, because the need for it increases with the intellectual development of the race." The time is ripe for the presentation of this question in popular form, and Dr. Richardson has performed a lasting service by directing the attention of the thoughtful to the great significance of the influence of the mind upon the body in the causation of disease. The subject is carried through fifty-five pages, and is discussed under the following heads: Acquired Disease from Moral Agencies; Acquired Disease from Mental Shock; Acquired Disease from Imitation or Moral Contagion; Acquired Disease from Hysterical Emotion; Acquired Disease from the Common Emotions or Passions; and Acquired Disease from Habits of Life.

Book the Third concludes the volume with a practical summary of the origins, causes, and prevention of disease. This is, perhaps, the most valuable part of the whole treatise, especially to those who are engaged in the practical work of directing and carrying out measures of prevention. At the same time the relationship existing between this and the preceding sections is such that no one part could have been omitted without destroying the logical sequence, and seriously impairing the usefulness of the work.

It would be confusing and unprofitable to revert to the thousand and more distinct facts discussed in the preceding pages, and seek the cause of each fact. It is thought better to confine the observations to the more common diseases, "those which yield the ordinary mortalities, and which, successfully combated, would leave little to be done in the way either of prevention or cure." By this limitation the number of diseases to be considered, in relation to their causes, is reduced to about one hundred, and corresponds quite closely with the tabular list published from week to week in the reports of the Registrar-General. Preventions have been restricted in the same way, under the conviction that, if we could discover the means of preventing the more common and fatal disorders, "the whole field of disease would be so reduced there would be little left to be done, except to maintain, systematically, the methods of prevention in all their integrity." These subjects, from their close relationship, are studied in one book. For convenience, it has been divided into two parts; the first of which relates to the origins and causes of diseases; while the second treats upon removals of causes, preventions or preventive measures.

The origins and causes of disease are divided into seven classes, namely: 1. Congenital, hereditary, and constitutional origins and causes. 2. Atmospheric or meteorological origins and causes. 3. Parasitical origins and causes. 4. Zymotic origins and causes. 5. Accidental origins and

causes. 6. Social and psychical origins and causes; and 7. Senile degenerative origins and causes.

In the chapter preliminary to the consideration of the influences of atmospherical conditions and climatic changes, allusion is made to the very interesting observations of Mr. Milner on the influence of seasonal changes on persons in health, in regard to change of weight; and also to the investigations of Dr. Richardson upon the influence of *devitalized air* upon the life of warm-blooded animals, that is, air changed and deteriorated by being breathed over and over again, although freed entirely from carbonic acid and other known products of respiration. Such air will not support life, not from the introduction of some poison, but on account of the withdrawal of some vital principle extant in the primitive oxygen.

Due prominence is given to the weather and seasons in relation to the causation of disease, and a vast array of important facts is cited under this head.

In the chapter treating of the parasitic origins of disease, a subject which has of late years absorbed so much of the attention and study of the scientific world, Dr. Richardson has very wisely chosen a conservative position. While stating clearly and fully the present status of our knowledge on this subject, he is careful to endorse only that part of it which is quite certain, and therefore of the greatest value. The theoretical and purely hypothetical is handled with the cautious conservatism that characterizes the truly scientific observer. The subject of the parasitic origin of phthisis pulmonalis, which has excited the keenest interest for the past two years, is discussed at some length. While admitting that a *bacillus* may be found in the expectoration and in the contents and walls of cavities in the lungs of persons suffering from phthisis, Dr. Richardson does not consider the evidence in our possession sufficient to warrant the conclusions with respect to its agency in the causation of the disease.

After having given the closest attention to the controversy, he remarks that "all that it seems to me can be honestly admitted in respect to the parasitic nature of phthisis pulmonalis, is, that in certain instances of it, perhaps in many instances of it, a vegetable parasite is found in the affected structure, and in the expectoration."

The chapter on zymosis or ferment as a cause of disease is very full, and states with precision, clearness, and fairness the present state of our knowledge on this much disputed question. A very valuable epitome, in twelve sections, of the views which are held in common by the best scholars respecting the nature of zymotic diseases, is first presented, then follows a fair statement of the various theories and hypotheses on zymotic disease, one of the most debatable subjects within the range of medical science. The *parasitic hypothesis*, the *vital germ hypothesis*, and the *nervous hypothesis* are all fairly summed up. To the last mentioned, "that which attributes the so-called zymotic diseases to a change in the natural zymosis, induced by an impression made upon the nervous system," Dr. Richardson gives his preference. He maintains this view, not only because it seems more fully to explain the history and phenomena of all these diseases, but also because of the practical usefulness of it in relation to the prevention of disease.

In the chapter on industrial and accidental causes of disease, these causes are classified in a table according to the parts affected and the diseases induced thereby, and, in this form, are handy for reference. The social and psychical causes are treated of under the heads of alcoholic

intemperance, dietary and cookery, moral surroundings, and uncleanness. A brief chapter on senile degenerative causes of disease concludes the first part of Book Third, on the origins and causes of disease.

The second part of Book Third, the concluding section of the volume, is the grand objective point of Dr. Richardson's labours, that upon which the instruction in the preceding pages all centres. If the reader has availed himself of the information contained in this intelligent summary of the phenomena and causes of disease, he is in the best possible position to fully profit by the sound, practical instruction which has been presented with admirable skill, thoroughness, and simplicity in the final chapters of the book.

Preventive measures naturally group themselves into position by the side of causes. As, for example, diseases of the zymotic class demand similar principles of treatment in regard to their prevention. Hence, it has wisely been determined to consider the measures of prevention in groups according to the causes of disease.

The three great agencies considered in treating all measures of prevention are the *personal*, the *municipal* or *local*, and the *central* or *governmental*. The position assigned to each of these agencies is clearly stated. The author believes the personal to be by far the most important; and he states that if this agency could be made perfect, all else would sink into mere nominal position. But perfection in personal agency is impossible; and therefore the other two agencies are required, and of these he considers the *local* to be pre-eminent. The fact is that all these agencies have their appropriate sphere of operation; they are all indispensable to the accomplishment of perfection in measures for the prevention of disease. A local government is undoubtedly of primary importance, but this should be supplemented by a central board of reference. In the United States, such a board should be connected with every State government, and, in addition, there is great propriety and even necessity, for a national board to take cognizance of all matters of a national bearing. Dr. Richardson would limit the functions of such a board to matters which apply to the country at large. It should be a central advisory body, capable of arbitrating between conflicting opinions, and of deciding disputed points. Its *personnel* should be of high order; such as would confer scientific dignity upon the nation, and be capable of fully representing the country in all matters of national and international progress. He, however, deprecates all interference in strictly local questions as presumptuous and unwise, and as tending to cripple local reform. These views are worthy of consideration, especially as they come from one who has lived under and closely observed the administration of laws which are no longer an experiment.

The principles of prevention are briefly summed up in a clear and instructive manner, in seven chapters, according to the classification adopted in treating of the origins and causes of disease. In these closing pages, Dr. Richardson evinces the happy faculty of extracting the pith of what is known on the subject, and of presenting it in a most simple, intelligent, and practical form. These rules of practice cover the entire field of prevention; and though, in many instances, they are by no means exhaustive, yet they are sufficiently suggestive and directive to guide the student in the proper channel of inquiry, and incite a desire for further information to be found in special works upon hygiene and sanitary science. Under this view, we are not disposed to find fault with what may appear to some to be a want of fulness in treating this portion of the subject.

Under the head of prevention of hereditary constitutional diseases, rules of prevention are given which apply to every period of life, beginning with those to be observed by the expectant mother, and followed by those applicable to infancy, childhood, adolescence, and to mature life.

Measures for the prevention of atmospherical, meteorological, and climatic disease relate to personal duties in regard to seasonal changes, protection from damp, sunlight, freshness of air, and to the duties of the local and central government in modifying and preventing some of the atmospherical causes of disease by appropriate legislation. For example, by attending to the proper planting of trees, by providing parks, subsoil drainage, and by the suppression of noxious exhalations from manufacturing establishments.

There is a chapter on personal and local authoritative rules for the prevention of parasitical diseases, which merits attention.

As the prevention of zymotic diseases depends upon the harmonious coöperation of all the agencies under our command, that is, the personal, the municipal or local, and the central or governmental, the rules prescribed have been appropriately arranged under these three separate heads. These rules present, in condensed form, the substance of the best knowledge of the preventive art. All controverted points, especially those relating to the nature and origin of the affections, have been wisely omitted, the object being to furnish a practical and useful summary of all the best known means at hand for combating these prevalent and dangerous maladies.

The personal rules for prevention relate to the removal of contagious material, to house drainage, isolation of the sick, management of the sick-room, the removal of the sick, disinfection, etc. Local authoritative rules for prevention include the subjects of removal of contagious material, town drainage, removal of house refuse, public water supply, supervision of milk supplies, provision of public laundries, hospitals for the infected sick, etc. Under the head of Central Authoritative Rules are considered the registration of diseases, compulsory vaccination, contagious diseases acts, and water supply and drainage. Dr. Richardson lays great stress upon the importance of perfection of drainage and sewerage as a means of attaining a natural death-rate. He favours the separate system of sewerage, and, at whatever preliminary cost, would advise, in the absence of natural advantages for the exhaustion of the sewage from a town, the provision of an artificial exhaust method, by which this dangerous matter and all foul air with it can be uninterruptedly carried away from the house "in one unchanging out-of-town direction."

His estimate of thirty gallons of water to each person is considerably below the proportionate quantity which is generally deemed adequate for the general uses of a city. He advises that, in crowded places, hospitals for the infected sick should be placed on the same level as the roofs of the houses, and that they be constructed of iron, so as to be effectually purified. We agree with the author in the recommendation that these hospitals, properly planned and conducted, should be in the midst of the community. The reasons which he gives for this advice we think conclusive.

Dr. Richardson is a strong believer in the prophylactic powers of vaccination, and is a firm supporter of the practice, but he does not favour a compulsory law. He believes that "the compulsory method is doing the greatest injury to vaccination, by making it so unpopular that people will

not listen to reason on the merits of the process ; in time it will bring discredit on the process altogether, as a useless and tyrannical measure." In view of the increasing tendency in this country to resort to legislative action for authority to compel vaccination, it would be well to ponder these views of a man of keen observation and sound judgment, who has had the advantage of studying the workings and influences of a law on compulsory vaccination which has been in force for years in England.

The author's conclusions in regard to the important issues involved in the Contagious Diseases Acts are also worthy of most thoughtful consideration. He believes that the moral and physical benefits resulting from the enforcement of this law—which relates to one of the worst forms of human disease—have been manifold and most satisfactory ; and he, therefore, endorses such legislation without hesitancy.

In the chapter upon preventions of accidental and industrial diseases, the greatest prominence is given to the personal element of prevention. This, of course, applies not only to the workers themselves, but also to those by whom they are employed. A number of useful suggestions are furnished for warding off the injurious influences liable to be encountered in the trades from poisonous substances, from gases, vapours, and dusts. Public work-rooms are suggested for the use of those who are obliged to work at home surrounded by domestic care and troubles, and other annoyances. Private work-rooms are known to be the centres from which contagious diseases are constantly being spread.

The personal rules for the prevention of social and psychical diseases are necessarily brief, as much has already been suggested in this direction in the chapter on the causes of these diseases. They refer to warming and ventilation, pure air, light, and water, and the healthy essentials for the house and for the bedroom. The constitution of local boards and the status of the medical officer of health are included in the consideration of local authoritative preventions, which also embrace suggestions for the utilization of soft water, for the provision of drinking fountains and public lavatories, public abattoirs, common lodging-houses, and recreation grounds. The work concludes with a brief chapter on the prevention of senile disease.

We have thus carefully presented, at considerable length, a full outline of the subjects discussed in this work, from which it is hoped a fair estimate of its value may be obtained. There is, perhaps, no similar work written for the general public that contains such a complete, reliable, and instructive collection of data upon the diseases common to the race, their origins and causes, and the measures for their prevention. The descriptions of diseases are clear, chaste, and scholarly ; the discussion of the question of the causation of disease is comprehensive, masterly, and fully abreast with the latest and best knowledge on the subject ; and the preventive measures advised are accurate, explicit, and reliable. All reference to the curative treatment of disease has been scrupulously avoided, as being derogatory to the character and mission of the book. This fact confirms the expressed intentions of the author, and will be appreciated by the profession and by the educated public. Though the book has been adapted to the general reader, the physician will find it to his advantage to freely consult its pages, and will discover much in it to recommend, line upon line, and precept upon precept.

The book is neatly and carefully printed on good paper, and is furnished with a full index and complete table of contents. Its general execution is highly creditable to the publishers.

W. H. F.

ART. XXII.—*Des Inoculations préventives dans les Maladies virulentes.*
Par le DOCTEUR E. MASSE. Paris, 1883.

DR. MASSE, of the Faculty of Medicine at Bordeaux, has, under the above title, collected an interesting history of the discoveries which have recently been made in the parasitic diseases, and he gives a detailed account of the work, which has resulted in our present knowledge. He calls attention to the immense benefit which comparative pathology has been to the progress of medicine, and he is an ardent believer in the idea that what has been accomplished among animals in protecting them from the zymotic diseases, will be applicable to the contagious diseases of man.

The author commences by a few generalities on the recent discoveries in regard to prophylactic inoculation. One attack of a contagious disease usually protects the subject from a future one. By whatever mode the virus enters the system, it produces the same result. Artificial viruses have been made by attenuating the natural ones. The first attempts at prophylactic inoculations were made in smallpox. They were the result of observation, and aimed only at the production of benign forms of the disease. Towards the end of the eighteenth century experiments were made to attenuate the virus of variola by dilution in milk, water, etc., but they then failed; to be repeated, however, in the present decade with perfect success. The discovery of Jenner in 1796 put a stop to further experimentation with the virus of variola itself.

In 1880 M. Pasteur reported that he had found a means to attenuate the virus of *chicken cholera* and produce a mild and protective form of the disease; the same year M. Toussaint reported to the Académie des Sciences that the action of heat on the virus of anthrax would diminish its activity and render it a prophylactic virus. In 1881 M. Pasteur arrived at the same result by a different procedure. In 1882 MM. Arloing, Cornevin, and Thomas made their great discovery of the vibron of blackleg, thus definitely separating it from anthrax, and they shortly offered the world a certain and practical preventive inoculation against this disease. M. Chauveau, in 1881, showed that minute quantities of virus would attenuate the effects of inoculation, and M. Peuch, in 1882, arrived at the same result by dilution. Inoculation for aphthous fever (foot and mouth disease) and contagious pleuro-pneumonia of cattle has been rendered practicable by the choice of less susceptible parts of the animal economy for injecting the virus. The great fact, established by Davaine, Chauveau, Pasteur, and Toussaint, has been that virus owes its pernicious quality to cellular elements endowed with life and analogous to ferments—are parasites. The generic name given them is *Microbes*.

Anthrax, or splenic fever, is a contagious disease, developing frequently among cattle and sheep (also fatally among horses, especially in Siberia, R. S. H.). Death arrives very shortly after the first symptoms, sometimes in two hours. Certain sections of country are much more infected than others, so much so that special localities are called "Champs, ou Montagnes maudits." The symptoms are those of severe blood lesion with nervous phenomena, due to internal hemorrhage and insufficient blood supply, the animals dying in convulsions. Putrefaction takes place rapidly. The post-mortem lesions are black tarry blood, which does not

coagulate, and general softening and local hemorrhages of the spleen, liver, kidneys, etc. An animal sick with anthrax transmits the disease rapidly to cattle, sheep, the horse, rabbits, hares, and the bear (?) ; the carnivora contract the disease with difficulty, and fowls are affected only under peculiar circumstances, *e. g.*, lessening of temperature. Man is affected through any abrasion of the skin with the production of a local lesion known as "malignant pustule;" this, if not energetically treated, is followed by general infection.

Malignant pustule is contagious from man to man. The author insists upon the clinical mistakes which are made, and considers that all "malignant pustules" are not the same, and that they may arise from different causes. An extensive review of the reports of Raimbert gives the symptoms of anthrax in man, and special stress is laid on the loss of will-power with the preservation of the great functions. M. Masse has carefully analyzed the reports of the disease in man, and points out a number of cases of symptomatic anthrax (blackleg) which have been mistaken for the former. Workers in hair brought from Siberia and South America are especially subject to anthrax and most frequently to general infection without local lesion, due to the spores contained in the dust and inhaled by the lungs. The points from which Davaine established the discovery that the bacteria (*bacillus anthracis*) were the cause of the disease are hastily reviewed. Pasteur completed the discovery by cultures of the microbe, which removed all doubt of a poison in solution in the blood or of the action of the corpuscles. That temperature is an important factor in the generation of microbes is shown by the immunity of fowls until their normal temperature is reduced by cold baths to 37° C., when they contract the disease.

M. Masse follows M. Pasteur in the distorted use of the word "vaccination" for prophylactic inoculation in other diseases than that of Jenner. Toussaint was the first to discover a "vaccine" for anthrax, which he produced by subjecting the virus to a temperature of 55° C., or by treating it with a 1 per cent. solution of carbolic acid. The *author* states that attenuation by heat has subsequently been perfected by Chauveau, but is less certain in its results than the procedure of Pasteur, who obtained his "vaccine" by successive cultures of the bacillus in the presence of air (oxygen) at a temperature of 42° to 43° C. to prevent the formation of spores. The author has either not consulted the statistics furnished by M. Chauveau's experiments, or he has the Pasteur mania of many Parisians; for the method of the latter is much less sure and practicable than that of Chauveau. The public exhibitions which decided the value of preventive inoculations for anthrax are cited in detail.

The author describes *symptomatic anthrax* (blackleg), as the second in which preventive inoculations are applicable. Had the recent book of MM. Arloing, Cornevin, and Thomas been published a little sooner, he could have declared it to be the most thoroughly studied disease of parasitic origin, and the one to rank first as a proof of the value of biological research. M. Masse has evidently had no practical experience with this disease, as he describes but the sympathetic form, where the general fever is followed by the appearance of tumours; the commoner form or essential anthrax, on the contrary, commences by a tumour.

The microbe of this disease is a vibron; larger than the bacillus of anthrax, and generally contains one or two refracting spores. This microbe is "exceedingly agile, rises, descends, and pirouettes on itself."

The vibron lives readily in the blood, but causes no lesion to it. Only when placed in the connective tissue (muscles and lymphatic ganglion) does it find its most appropriate medium of culture and proliferates rapidly, destroying the neighbouring tissue and producing a mortal tumour. Injected into the tissues, this latter result is inevitable; in the blood directly, or indirectly through the lungs, a moderate fever only results, unless a traumatic lesion allows its escape to cause a tumour. *Per se* the vibron will not force an exit through the endothelium of the vessels. This characteristic led MM. Arloing, Cornevin, and Thomas to their first prophylactic inoculations; they injected the virus into the veins, avoiding contact with the tissue, and the general fever produced, granted immunity to the animal. This method has also found application in contagious pleuro-pneumonia. Owing to the danger from the operation of intravenous injection, attenuation by heat was resorted to. A solution of dried virus is exposed during six hours to a temperature of 85° and 100° C., and produces two grades of attenuated virus; the one is safe to employ with sheep and the most susceptible cattle, while the stronger confers a permanent immunity against the disease. MM. Arloing and Cornevin found that very young animals (under three to five months) are refractory to the disease, except that the virus be used in large quantity. Susceptibility commences about the time that the calves become herbivorous. In infected countries, cattle become refractory after the third or fourth year. This they attribute to spontaneous inoculation, probably to the inhalation of dried spores. Unlike anthrax, the microbe of blackleg penetrates the placenta, and the foetus is infected with both the general fever and local tumours.

In *chicken cholera* the microbe, in the form of solid granulations, discovered by Perroncito, causes destruction of the blood. The liquid in which these microbes are cultured is itself not virulent, but has a narcotic quality due to a sort of diastase excreted by the parasite. The attenuation of this microbe was accomplished by Pasteur, by successive cultures in the presence of air (oxygen, Pasteur). M. Masse ends the chapter on chicken cholera with many fewer facts than hypotheses. He states that fowls inoculated with this disease are refractory to anthrax, ignoring that they are always so unless reduced in temperature. He also proposes several other visionary and unproved "vaccinations."

In the chapter on *Vaccination against Septicæmia*, the author appears most sanguine and visionary. He writes as if there was but one form of septicæmia, and but one vibron was the cause of both septicæmia and putrefaction. Because the vibron of septicæmia increases and decreases in virulence according to its medium of culture, he seizes upon the latter quality to suppose a "vaccine," but does not show that septicæmia is a self-protective disease.

In *Vaccination against Smallpox* the author reviews the discovery of Jenner, and uses too little argument to establish the identity between the horsepox, cowpox, and human vaccinia. Because M. Jolyet has made a serious and celebrated study of the variolæ, and has seen microbes in all forms of the disease, we cannot accept as readily as M. Masse does that *these* microbes are the cause of variola. The experience in veterinary medicine, and the great work of Chauveau, are against the author's belief that the variolæ of man, the horse, hogs, and pigeons are identical.

The chapter, entitled *Variolation and Clavelization*, is simply a cursory review of the history of variolation and clavelization. It ends, however, with Peuch's method of inoculating the variola of sheep by dilution in

water, 1 to 50, which has given a mild form of the disease without pustules, and grants immunity to the sheep from future attacks of the disease.

Contagious pleuro-pneumonia and aphthous fever of cattle is due to a virus, of which the virulent element has not been discovered, but the lung exudation contains it. Willems, who first demonstrated that inoculation of it in an appropriate part would produce a protective fever without lung lesions, found peculiar corpuscles, but no culture of them has succeeded. In this disease the tissue modifies the intensity of the virulent development. Inoculation in the dewlap produces almost inevitable death, while in the dense connective tissue of the tail rarely more than a slight local lesion, followed by immunity, is seen. Thiernesse and Degive communicated, in 1882, their success in preventive inoculations by injecting the virus directly into the veins. The author is perfectly in accord with these experimenters, and with M. H. Bouley, in answering M. Jules Guérin, that the disease can exist *without* the animal economy showing the symptoms and lesions which characterize the natural or "spontaneous" disease.

Inoculation in aphthous fever has been practised for a long time. As this disease is protective, and as it causes great loss of work and milk in the animals attacked, it has been found economical to have all on a farm attacked at the same time, and at seasons when their production can best be dispensed with, and most time can be given to their care. The disease artificially produced is as severe as the natural form, but choice can be used in determining the site of the local lesion.

The author says that the study of prophylactic inoculations presents a great question in comparative pathology, which seems destined to overthrow (many ideas in) human medicine and therapeutics. One fact seems perfectly established to-day, that there exist for nearly all the virulent diseases special micro-organisms, and that certain microbes live in several of the animal species. There are, however, certain individuals which are refractory to the virulent diseases; due, either to the absence of the necessary conditions in which the microbe can live, or to a previous spontaneous inoculation. Immunity is the same, whether the previous attack was mild or severe. Certain relatively benign affections protect against virulent diseases, which are not identical with them, as in vaccinia. Small doses of virus by the *procédé Chauveau* confer immunity in the same manner as the "spontaneous vaccinations" from cohabitation.

Immunity may be transmitted to the foetus, and may be given to the products of future pregnancies. Lastly, the virus may be attenuated in its power. Here M. Masse retains the old Pasteur hypothesis that the oxygen of the air is the attenuating factor. It would have been better to include, as Paul Bert recently did, any factor which retards the development of the micro-organism.

Temperature and many special conditions prevent the reproduction of the agents of the viruses (anthrax in fowls and frogs). Delafond and Bourguignon showed that healthy fat sheep would not harbour the ascari; the same sheep subjected to a debilitating régime were readily affected, and when again fattened got well spontaneously (we find the same selection in the tinea, R. S. H.). There are two important factors—the *microbe* and the *receptive medium*. If we cannot purge the universe of the first, we can at least modify the latter. *Duclaux* believes that, in their development, the microbes appropriate certain constituents of the blood which, like the liquid which has undergone fermentation, renders it improper for a second culture. The author does not think that this hypothesis accounts for im-

munity which lasts a lifetime. He neglects to give M. Arloing's hypothesis that the microbes excrete a product which is poisonous to themselves and prevents future development. Certain microbes identical in form are very different in their functions; the same microbe can present several forms. To demonstrate the difficulties attending the discovery and separation of a specific germ, and the care which must be exercised in freeing it from all others, the author cites the germ taken from a case of hydrophobia and shown by Pasteur at Geneva. He uses the same unfortunate language which was then used by Pasteur when he compromised himself by stating what he did not mean to say. Again, M. Masse quotes Pasteur in regard to the typhoid fever of the horse, and identifies it with that of man, because the same name is used.

The author ends with the following: "The combat only commences. The battle will be long, and the little partial victories should only encourage us to increase our courage, energy, and perseverance. We have scarcely commenced this great struggle against the contagious diseases, a veritable struggle for existence with new arms which we must learn to use."

R. S. H.

ART. XXIII.—*The Treatment of Wounds: Its Principles and Practice, General and Special.* By LEWIS S. PILCHER, A.M., M.D., Member of the New York Surgical Society. 8vo. pp. xi. 391. New York: William Wood & Company, 1883.

DESPITE the labour and observation of many centuries, the subject of wounds is one concerning which much is still unsettled, and which from its importance makes every thoughtful suggestion of interest. In no branch of science have there been greater changes and advances of late years, and amid the discoveries and wonders of the age, the surgeon may confidently point to the progress his art has made as evidence that with even step the science of medicine has kept abreast of the times.

Operations which a few years back were not even dreamed of, have been again and again successfully performed, with results which are most encouraging to the bold and fearless surgeon. How much of the astonishing success which has attended certain of these measures is attributable to certain details of treatment, and how much is owing to a successful rebellion against the traditional usage of the past, are questions eagerly discussed at the present day.

The volume before us is a contribution towards the solution of the problem, and will be read with interest by all who are seeking information upon the subject.

The plan which Dr. Pilcher lays down for study is, first, the immediate effects of a wound; second, the processes instituted, when undisturbed, for the repair of injury; third, sources of disturbance, and their effects upon natural processes of repair; and fourth, the means by which reparative processes may be favoured, and the action of disturbing agents modified.

All injuries are regarded as wounds, whether subcutaneous or open, and brief reference is made to the old divisions into incised, punctured, etc. When poisoned wounds are under discussion we find the opinions of

Dr. Pilcher very clearly expressed, for he extends the definition to include all in which poisonous materials exist, whether it be that of a serpent or a micrococcus. According to our author, all wounds are either aseptic or septic, and it is upon this theory, and special classification, his book is constructed. Poisonous germs may be introduced by the object causing the injury, by a failure to erect a barrier against their entrance from the atmosphere, or in rare instances through the blood of the patient, but without their presence no putrefaction or death of tissue results, no suppuration or inflammatory change is observed. Inasmuch as suppuration and sloughing do occur after full antiseptic precautions, as we have repeatedly seen, and as it is impossible to say that these malevolent germs have not found their way into the wound from the blood-vessels, it is impracticable successfully to controvert such an assuming theory, or at least to do so to the satisfaction of its upholders.

Some general and wisely comprehensive pages upon the modifying influence of age, habits, temperament, and constitutional condition occupy the remainder of the opening chapter.

The second chapter treats of the immediate effects exerted by wounds and the processes connected with their repair. A good condensed account is given of this process, as normally exhibited, when the exudation is not excessive in amount, and undergoes organization, constituting union by first intention. Attention is then paid to the disturbing elements which come in to interfere with the proper completion of this process, and to produce the modifications in the healing process known as secondary union, and union by granulation.

In Chapter III., we come face to face with the *raison d'être* of the book, namely, the relations of micro-organisms to wound-disturbances. While Dr. Pilcher does not fail to recognize the other influences which interfere with the healing of wounds, such as defective apposition, excessive exudation with retention of fluids, and the presence of devitalized tissue, it is in the admission of foreign bodies, of micro-organisms, that the author finds the great fountain and origin of the evils that beset the healing of wounds. Upon their presence it is thought all the manifestations of putrescence depend. They may be present in one of the spherical forms known as micrococci, as the sausage-shaped bacteria or the rod-shaped bacilli, but in either form their presence is always for evil. The view of many surgeons, so ingeniously presented by Dr. William Hunt of Philadelphia, that these minute germs are in reality an army wisely directed for the removal of effete material, and harmless in the vast majority of cases, is somewhat summarily disposed of by Dr. Pilcher with arguments which are satisfactory to himself at least. A very good and clear account of the carefully conducted experiments of many observers on the production of micro-organisms in culture fluids is then given. Following this there is a summary of the results obtained by some surgeons with various antiseptic methods.

He must be a bold and self-confident man who, in the face of the results thus obtained by competent observers, denies the advantage accruing from the methods adopted by them. But there are two difficulties which occur to the writer of this review which stand in the way of a complete acceptance of their views. One of these reasons is that there is hardly any new method of treating disease which has not enjoyed the equally enthusiastic support of its adherents, or which has not had as marvellously favourable statistics cited on its behalf. The other is in deciding which

of the methods recommended by these observers is the best one to follow. The men who a few years back were enthusiastic supporters of all the minutiae included in the system so ably advocated by that great surgeon, Sir Joseph Lister, are now found practising quite widely different modes of treatment, while the statistics of some modern operators, who do not rely on the technical antisepsis, such as Mr. Lawson Tait, are found to be equally as favourable as any of those cited by Dr. Pilcher.

Individual experience, always limited, goes for very little, for the honest observer will very often be forced to admit that he has seen suppuration and septicaemia occur in cases where all the precautions of Listerism have been most scrupulously observed, while there is hardly any surgeon who will not recall many cases of rapid union in wounds entirely unprotected from the malevolent germs, of which Dr. Pilcher writes at such length. It is indeed a matter upon which it does not become any wise man to dogmatize, but one which he will closely watch, and expect that the day is not far distant when the accumulated results of experiment and observation will decide how much of the improvement which has taken place in the treatment of wounds is owing to special antiseptic dressings, and how much is attributable to the careful coaptation of wound surfaces, the prevention of accumulations of fluid between them, the protection of the parts from undue motion, together with the observation of strict cleanliness.

The next two chapters present an admirable account of the various antiseptic methods in vogue at the present time. Indeed we are not acquainted with any work containing such full and detailed summaries of the subject as are included in this volume.

Chapter VI. begins the second section of Part I., and deals with the arrest of hemorrhage. It is fully illustrated, and gives ample and accurate descriptions of the natural processes by which the flow of blood from injured vessels is stopped, and of the principles upon which the modern and rational treatment of hemorrhage is based. Considerable space is devoted to describing the use of the hæmostatic forceps of Péan, Kœberlé, and Wells, but no opinion is expressed as to their value as compared to the ligature. No opinion is expressed of the value of acupressure, but a very decided preference is given to the prepared catgut ligature as compared with any formed of other tissue. As a whole, the subject is most satisfactorily treated.

Shock and Anæmia are discussed in Chapter VII., neither of them with much thoroughness, but in connection with the latter topic there is considerable space given to transfusion and to the description of the varied apparatus devised at different times to facilitate the operation. There can be no question that in anæmia dependent upon hemorrhage, the favourable estimate placed upon this measure by Dr. Pilcher is borne out by recorded results, which is not equally true of the procedure when the anæmia is the result of other morbid processes.

The directions given in the following chapter are marked by thoroughness, minuteness, and common-sense. The methods of properly preparing sponges are detailed at some length, and the author is confident that when prepared as he directs they may, by repeated disinfections, be safely used for an indefinite period. The success obtained by some authors in the use of complete submersion of the wound is fairly accounted for by Dr. Pilcher, upon the theory that the constant flow of fluid effectually removes any objectionable detritus, and even prevents the permanent lodgment

of the germs it itself conveys. Drainage is considered in this connection, and detailed descriptions are given of the various tubes devised to carry out the indication. While the spray apparatus is described along with the other means accessory to a proper cleansing of the wound, the opinion of its actual value is a very modified one, but much stress is laid upon the importance of paying scrupulous attention to the disinfection of instruments, surrounding surfaces, and the hands of the surgeon, all required in consistency with the theory so firmly held by the author of the volume. Taken as a whole the chapter is distinguished by the soundness of its advice, and the good judgment it displays, although we should dislike to have a septic wound upon our own person subjected to some of the scrapings and gougings advised.

The same expression of warm approval is deserved by Chapter IX., which treats of the proper apposition of wound surfaces. Considerable space is devoted to some of the infinite variety of sutures, and numerous illustrations are given of the forms referred to. We are ourselves convinced that in the attention bestowed upon this subject lies at least one of the elements which have contributed to the improved results obtained of late years in the treatment of wounds, and no surgeon can afford to neglect the principles which underlie many of the newly devised sutures described with admirable clearness in this chapter.

The next chapter is comparatively a long one, covering more than twenty pages. It deals with the various antiseptic dressings introduced of late years and contains a sufficiently full account of the methods of preparing and applying each one of them. This subject, the protection of wounds against disturbing influences, is continued in the following chapter, and attention is directed to the importance of rest, as secured by position, compression, and apparatus by which immobility is secured.

In Chapter XII. Dr. Pilcher treats of "the relief of disturbances of healing." He details some of the more modern modes of treating inflammation, and is of the opinion that while ligation of a large artery may be resorted to as a means of subduing destructive inflammation, the severity of the operation is too great to permit of its being lightly made use of. Gangrene, Erysipelas, and Septicæmia are also treated of in this chapter, but the *résumé* in which Dr. Pilcher sums up the subject of inflammation shows that these complicating disturbances in the process of healing need not be expected where the principles deducible from the germ theory are properly grasped and thoroughly carried out. Says Dr. Pilcher: "The various resources which have been mentioned for antagonizing and mitigating traumatic inflammation are sanctioned by the practice of the past and by the authority of surgical teachers; but the more accurate knowledge of the present with reference to the essential causes of inflammatory disturbances of wounds must relegate them to a less important place, while the greatest importance must attach to those measures which may rid a wound of the agents and subjects of sepsis." The final establishment of such views will indeed very much simplify the practice of surgery, and prove a boon to humanity, but meantime we must be content to await the demonstration which will not only satisfy those who have adopted the theory, but which will be so plain that there will be no opponents to it.

Part II. comprises special wounds, and its opening Chapter XIII. has to do with subcutaneous, incised, contused, and lacerated wounds. On

page 239 reference is made to the beneficial effects attending massage very early after the receipt of an injury, especially in the case of sprains, as pointed out in a paper by Dr. Graham in the *Medical Record* for August 11, 1877. Although the observation was not new to the experience of many surgeons, we are of the opinion that the practice is not so largely made use of as its value merits. Gentle, firm, and gradually increased motion, combined with the rubbing and friction known as massage, will immensely relieve many of the less severe sprains, and very much hasten their recovery. The advice contained in this chapter is sound and good, while the importance of securing a vent to pent up discharges in punctured wounds is very properly insisted upon.

Gunshot wounds are treated of in Chapter XIV. in a manner which is neither conclusive nor fair. The extreme views of some moderns are adopted and endorsed without question, while the only authority quoted is that of Reyher, whose experience in the Russo-Turkish war is given in *Volkmann's Journal* for August, 1878. There is an attempt to bolster up the views to which we have referred by quotations from the limited experience of this gentleman, which are of absolutely no value whatever as given by Dr. Pilcher, for the reason that there is no opportunity afforded to decide whether the cases treated by him antiseptically were similar to those treated by his colleagues upon less extreme and less exclusive principles.

The experience of the American war, as exhibited by the surgical volumes of its Medical and Surgical History, showed at least one thing, viz., the difficulty of instituting comparisons between series of cases apparently resembling each other, and it is only after most careful sifting, and the selection from the mass of cases in reality similar, that it is practicable to derive valuable conclusions which can serve as rules for the guidance of the future. Now no attempt is made by Dr. Pilcher to deal thus with Dr. Reyher's statistics. We are told that, of a certain number of wounds of the knee treated by Reyher, a much more favourable result was obtained than in those treated by his colleagues, but we are not told anything of the character of the wounds in the two sets of cases. We are not told in how many the joint was actually involved, nor how extensive was the injury when such was the case. We are not made acquainted with any of the surrounding circumstances which attended the practice of Reyher, which was very successful, nor with those which attended that of his less successful colleagues. We do not impugn the statistics furnished from Reyher, but we do not think that such use is made of them as ought to convince any one of the propriety of the exclusive method of treatment recommended so enthusiastically by Dr. Pilcher, as having saved the lives of three or four times as many as he would have succeeded in doing by older methods.

Dr. Pilcher advises that such gunshot wounds as cannot be at once sealed antiseptically should be thoroughly examined with full antiseptic precautions once for all, any irritating or foreign material removed, suitable drainage secured, and the wound afterwards left to protection by germicidal dressings. He would remove the bullet if found, but would not attempt its formal removal as a matter of primary importance, unless there was evidence that it was acting as an irritant.

We have not space to follow our author through the details of antiseptic dressing contained in Chapter XV., which deals with external wounds

communicating with fractures of bones and with joint cavities, but must refer the reader to the book itself. It will be sufficient to say that in it will be found very full and minute directions taken from the work of Bruns, and that we know of no better place to which the surgeon who desires to adopt such methods can turn for detailed information upon the subject.

Chapter XVI. begins the second section of Part II., and has to do with wounds of muscles, tendons, and nerves. Under the former head we cannot but notice what seems to us to be most unsound advice. Dr. Pilcher counsels that in rupture of muscles we should divide the skin and suture the separated ends together, and if they should prove to be ragged, that we should trim the ends before inserting the sutures. While all this evidences the confidence the Doctor has in the absolute security with which wounds can be treated under the latest methods, we altogether doubt the wisdom of the advice he gives to convert a subcutaneous injury into an open and deep wound. When disability which promises to be permanent results from rupture of a muscle the advisability of undertaking an operation for its relief may very properly be considered, as in those cases where the divided ends of tendons have failed to unite. The subject of suturing nerves is well treated and fully represents the latest views.

In the next chapter wounds of the bloodvessels are considered in a very full and satisfactory manner, although we confess to much surprise that no mention is made of the admirable and classical papers by Dr. S. W. Gross, in the numbers of this Journal for January and April, 1867, upon Ligation of Veins. In those papers, while dwelling upon the ligature as a venous hæmostatic, Professor Gross gives forty-three cases in which the internal jugular was tied. No man who undertakes to discuss wounds of veins can afford to neglect such well-known contributions to our knowledge of the subject as are contained in the articles referred to, yet we are loath to believe that any personal feelings could actuate a writer of Dr. Pilcher's ability in passing them by. The omission is a serious blot upon the volume.

The third section of the Second Part has to do with wounds of special regions, and is the most interesting in the book. In four successive chapters, wounds of the head, of the neck and thorax, of the abdomen and pelvis, and wounds of the extremities involving the question of amputation, are considered. In these chapters will be found a pretty full *résumé* of the most modern views and observations, but from the necessarily narrow space in which they are included it is nothing more than a *résumé*. The opinions of Dr. Pilcher are conservative upon many points. He frequently contents himself with making quotations from well-known surgical authorities rather than with expressing any conclusions of his own. We have not space to follow Dr. Pilcher through these concluding chapters. We have read them carefully, and not only have we found them interesting, as we have intimated, but are of the opinion that the advice they contain is sound and good. There is somewhat too much space devoted to what are as yet rather curiosities of surgical experience than cases establishing rules of conduct, and there is a disproportion in the minuteness with which certain remedial measures are treated, such as intestinal sutures, which their importance and frequency do not warrant, but these details in no way detract from the interest with which these closing chapters will be read.

In conclusion, we think that the book will be improved both by contraction and expansion, for we take for granted that so good a book as

this is will appear in other editions. Thus, we cannot but think that if Dr. Pilcher condenses what he has to say upon antiseptics, and says it once for all, and utilizes the space thus gained by a further elaboration of those chapters upon special subjects, the value of the volume will be much enhanced. As it now stands, it is a notable addition to the standard library of its publishers. S. A.

ART. XXIV.—*Legal Medicine*. Volume II. By CHARLES MEYMOTT TIDY, M.B., F.C.S., Master of Surgery, Professor of Chemistry and of Forensic Medicine at the London Hospital, Official Analyst to the Home Office, Medical Officer of Health for Islington, etc. 8vo. pp. 508. Philadelphia: Henry C. Lea's Son & Co. 1884.

In a former number of this Journal (January, 1883), we gave a somewhat extended review of the first volume of Dr. Tidy's elaborate work on Legal Medicine. The satisfaction then expressed with that portion of the work is in no wise lessened by a perusal of the second volume, which has been recently issued from the press, and in the same attractive dress that distinguished its predecessor.

On looking through this volume, we find it characterized by the same fulness of detail and clearness of expression which we had occasion so highly to commend in our former notice, and which render it so valuable to the medical jurist. We may again call attention to the copious tables of cases appended to each division of the subject, which must have cost the author a prodigious amount of labour and research, but which constitute one of the most valuable features of the book, especially for reference in medico-legal trials.

The present volume comprises two distinct parts, the first of which may be denominated the Jurisprudence of Obstetrics, including the medico-legal consideration of Legitimacy and Paternity, Pregnancy, Abortion, Rape, Live-birth in its civil and criminal relations, and Infanticide. The second treats of violent death from the different forms of asphyxia (apnoea), viz., Drowning, Hanging, Strangulation, and Suffocation.

Each one of the above subjects affords material of the deepest interest to the legal physician, but we can give only a hasty glance at two or three that have seemed to us to deserve a more special notice.

Under the head of Legitimacy, one of the most important and interesting topics treated of is the much-vexed question of *protracted gestation*: Is the period of human gestation *absolutely* fixed and invariable? and if not, how far may it exceed its usual term, within the bounds of accepted legitimacy? This question, although fully discussed, does not receive much elucidation from our author, and for the simple reason that it cannot be definitely settled. We think it must be admitted that the duration of pregnancy in the human female is liable to variation, and from causes not yet perfectly understood. This view we deem to be sustained both by analogy with the lower animals, among whom the term of gestation is known to vary considerably, and also by numerous authenticated cases of women, where the pregnancy could be positively dated from a single coitus, and yet where its duration varied as much as *forty days*, in the

different instances adduced. As our readers are aware, the laws of various countries allow a considerable latitude in cases of this nature, the Code Napoléon allowing three hundred days, and the Prussian law three hundred and two days, as the limit. The United States and Great Britain have no statute on the subject; but in this country, paternity has been affixed, in one case, to as long a period as three hundred and thirteen days, and in another to three hundred and seventeen days, from the last coitus; whilst in England, legitimacy has been allowed for periods of two hundred and ninety-four, two hundred and ninety-nine, and three hundred and one days respectively; but disallowed in the Gardner Peerage Case, for a period of three hundred and twelve days; though in this particular instance on moral rather than on medical grounds.

Under this same head, a brief allusion is made to an interesting, though unexplained physiological fact, viz., that an impregnation by one man may extend its influences over the offspring begotten subsequently by another man; so that in cases where the mother marries a second time, the child may resemble neither parent, but the first husband. Of this fact there is abundant proof, also, among the lower animals.

Under the head of Pregnancy, the only topic that we will advert to is the value of the *corpus luteum* as an evidence of the previous pregnant condition. This subject has proved a fruitful source of discussion; and a greater value was formerly attached to this so-called evidence of pregnancy than at present.

Whilst it is generally true that a *corpus luteum*, or a stellated cicatrix, is formed in the ovary after the discharge of a ripened ovum, this formation does not invariably follow the menstrual flow, for the reason that *ovulation* does not always necessarily accompany menstruation, as is witnessed in cases of very early menstruation—*e. g.*, when it occurs at birth, and under one year of age; and still more especially where this function has continued after the removal of both ovaries. It is, however, true that the *false corpus luteum*, or that which accompanies the escape of the unimpregnated ovum, differs from the *true corpus luteum* of pregnancy in certain particulars, such as its shorter duration, the less complete development of the stellate structure and yellow colour, and the absence of a central cavity. This must be admitted to be the general rule; and the reason usually assigned for the increased growth and development of the corpus luteum of pregnancy is the increased nutrition received by the Graafian follicle through the stimulus of impregnation. But what shall be said of those cases in which impregnation takes place *after* the escape of the ovum, and where, consequently, this "increase of nourishment" must be wanting to the ovule *while in the ovary*? Moreover, how shall we reconcile those anomalous cases where a corpus luteum exists in which there has been neither pregnancy nor menstruation? The author cites two illustrations of this last character: One, that of a prostitute, who was poisoned by prussic acid, who was neither pregnant nor menstruating, and in whom a fully-ripe corpus luteum was found after death. The other, a woman, who died, aged forty-one, from gangrene of a uterine fibroid; the ovary contained a perfectly-formed corpus luteum resembling that of pregnancy. In both these cases, the author very properly ascribes the abnormal development to the increased determination of blood to the part. His conclusions upon the subject, we think, are fully warranted: "*first*, that there may be pregnancy, and, notwithstanding, a complete absence of a true corpus luteum; and, *secondly*, that bodies undistinguishable from true corpora

lutea may be found where there has been no pregnancy, and (as I have myself noted) in aged women, long past the period when pregnancy was probable."

The *very earliest* period of pregnancy yet noticed is recorded by the author (from *Gaz. Hebdom.*, M. Lefevre), that of a girl who menstruated at four years, and became pregnant at eight years. Another case (*Lancet*, April, 1881), in which pregnancy occurred at eight years and ten months, and where the child at birth weighed seven pounds.

In the article on Live Birth, under the head of Tenancy by Courtesy, we are pleased to find ourselves in accordance with the author in relation to what should be accepted as satisfactory proofs of a *live birth*, in order to pass an estate to a husband, which is contingent upon *live issue* of a deceased wife. We have known the ground taken by eminent jurists and physicians, at a trial involving this very question, that the only admissible proofs of a live birth are breathing and voluntary motion. But we entirely agree with the author that the pulsation of the child's heart, or temporal artery, or of the umbilical cord, at the time of the birth, is sufficient to show that the infant was alive, inasmuch as the above actions could not certainly occur in a dead child. Moreover, this latter and broader view of the matter seems to be gradually gaining the assent of jurists in cases of the above nature, although, we believe, that in Scotland the more restricted rule yet remains in force, which requires that the child should actually *cry* before it can be deemed to be alive.

In the chapter on Drowning, among the post-mortem signs, that one which is usually regarded as most distinctive, namely, the presence of *bloody, frothy mucus* in the bronchial tubes and pulmonary air-cells, receives appropriate notice. The above condition of the respiratory organs, together with the peculiar sodden, doughy state of the lungs, causing them to pit on pressure, and dependent upon the presence of water in the vesicles, is considered by many authorities as positive indications of death by drowning. Yet Dr. Ogston states, that in 48.7 per cent. of cases of drowning, no water was found in the lungs, and he accounts for its absence by its transudation from the lungs into the pleural cavities, where it was found in quantities varying from one to thirty-four ounces. Moreover, it should be remembered, that for this test to be of any value, the examination must be made upon the body of one recently drowned, and very soon after removal from the water.

It is the opinion of the author that "the absence of this froth is not to be regarded as proof that the death did not result from drowning," because "the convulsive struggles to breathe, necessary to produce this froth, may not have occurred (*e. g.*, after death by shock, syncope, or exhaustion)."

If the above signs are no longer to be considered as characteristic in cases of drowning, we are certainly left very much at sea in the matter of diagnosis. In the late Jennie Cramer case, at New Haven, Conn., the absence of this condition of the lungs, after the body had been taken out of the water, was regarded by some as a very strong proof that she had not perished by drowning. About the same time, we had occasion to examine the body of a woman taken from the river Delaware, who had *presumably* perished from drowning, in which there was a complete absence of the above-described conditions of the lungs; the brain also was in rather an anæmic state. If, then, this is to be regarded as an exceptional case, along with those of Dr. Ogston, the conclusion would be

warrantable that, in the Cramer case, the real cause of death may after all have been due to drowning, *after* the administration of the poison that was subsequently discovered in her body. This is a subject of considerable medico-legal importance, and it requires further elucidation before it can be regarded as settled.

The chapters on Hanging, Strangulation, and Suffocation are sufficiently full and accurate in details, but require no particular observations in the present notice.

J. J. R.

ART. XXV.—*Ueber Pyurie (Eiterharnen) und ihre Behandlung.* Von Dr. R. ULTMANN, in Wien. *Wiener Klinik*, I. und II. Heft, Jan. und Feb. 1883. 8vo. pp. 60.
Pyuria and its Treatment. By Dr. ULTMANN, of Vienna.

ANY one familiar with the careful and painstaking way in which Dr. Ultmann has studied and treated the disorders of the genito-urinary system for years, will look with especial interest for his opinions in regard to any one of them. And one who knows nothing more of him than can be gathered from such a publication as is before us will see that he speaks from a large experience, and with the manner of one who has profited by it.

The style of the teacher, which is manifested in most of this author's writings, is easy to understand when one knows that for about fifteen years Ultmann has been lecturing on the diseases, a part of which this book considers. To this habit may, perhaps, be attributed the fact that the monograph before us begins with a rather elementary account of the appearance of various urinary sediments, principally of pus, and some simple directions how to decide from what portion of the urinary tract they come. After this, the main subject is taken up, in the following order: (1) Pus from the urethra, as far back as the compressor urethræ; (2) pus from the neck of the bladder or pars prostatica; (3) pus from the bladder; (4) pus from the pelvis of the kidney or the kidney itself. The first division of the subject includes simple catarrh of the urethra, and gonorrhœa. The second division furnishes the author an opportunity to defend, for reasons of convenience, and on physiological grounds, the use of the term "neck of the bladder." This, to our mind, he does satisfactorily. The third division of the subject includes cystitis. Here, in addition to the text, we have two excellent cuts to show the microscopical appearances of the sediment in urine which is alkaline from the presence of fixed alkalies, and that in which the alkalinity is due to decomposition in the bladder. Finally, this part of the monograph closes with an account of the nature and symptoms of pyelitis.

The concluding part is devoted to the consideration of the therapy of the disorders mentioned. In the first place, without attempting to treat the subject systematically, the author gives some very valuable hints in regard to the matter of gonorrhœa. For example, he dwells upon the importance of recognizing the fact that in the majority of cases the treatment must not be too vigorous, but directed to securing the uncomplicated progress of the inflammation to its natural end. This necessitates regulation of all the manner of living of the patient. Yet, that this is not a

sure road to success is seen in the fact that even cavalrymen, while continuing their arduous duties, sometimes get along without any trouble, while those who have been most scrupulous in taking care of themselves have most disagreeable complications. The importance of diet is dwelt upon, but we miss one recommendation which we think of considerable importance, namely, to drink large quantities of water. The use of cubebs and copaiva is, we think, properly deprecated. The abortive method is, as in most modern writings, held to be dangerous, or misleading. It is said that the method proposed by Watson Cheyne—iodoform bougies—might prove valuable in case it were established that gonorrhœa was caused by a special bacterium. But to this theory the author does not commit himself. For the acute inflammatory stage Dr. Ultzmann advises against the use of even mild astringent injections; here the best is a $\frac{1}{10}$ per cent. solution of carbolic acid. When the urethra is less irritable he recommends a solution of crude alum, sulphate of zinc, and carbolic acid, each, 30 centigrams in 200 grams of water; or permanganate of potash 2 centigrams in 200 grams of water. Mechanical mixtures of insoluble substances he does not think well of. In chronic gonorrhœa he speaks favourably of the use of large steel bougies, and recognizes the merit of Otis in showing their practicability and value. When the treatment with bougies is supplemented with medicinal applications, he calls attention to the practical point that the bougies must not be oiled, but lubricated with glycerine. The way to irrigate the urethra is carefully and sensibly described; but we may not linger over its details. In concluding this division of his subject the author emphasizes the importance of recognizing and treating any constitutional condition—such as syphilis or tuberculosis—which may hinder the cure.

The importance of an accurate diagnosis is seen when the treatment of catarrh of the neck of the bladder is taken up. Here the treatment with sounds does harm, and it is important that the medicament shall be applied to the very spot of the inflammation. The way to do this is admirably explained, and figures of the necessary instruments add value to the text.

In regard to acute cystitis the use of mild diuretic drinks is advised, together with rest and a regulated diet, emollient cataplasms, and narcotics. Belladonna is said to be a very uncertain drug, and a combination of opium and lupulin is recommended. The treatment of chronic cystitis should always be local. The exact method depends, of course, on the cause. Stone must always be sought for. Then, if no stone be present, the treatment consists principally in suitable washing out of the bladder, and the application of medicated solutions afterward. For very offensive catarrhs the use of 3 to 5 per cent. solutions of resorcin is recommended, or a drop or two of nitrite of amyl in 100 grams of water. In chronic cystitis the patient will sometimes fail to be cured by any therapeutic course, but soon recover if sent away to a health resort where his surroundings are more favourable.

Pyelitis, if acute, Ultzmann treats with rest, quinine, morphia, and mild drinks. Chronic pyelitis calls for a milk cure, and warm baths with the administration of tannin, quinine, or alum. The inhalation of the vapour of turpentine is also of value at times. For pyelitis calculosa the author advises following the indication of the constitution of the calculus. In most cases this leads to the use of carbonate of lithia, as a solvent of uric acid. Finally, tuberculous pyelitis demands treatment addressed directly to this diathesis.

In concluding this synopsis of Dr. Ultzmann's monograph we can heartily recommend it to the study of all who have to treat the disorders which it discusses. Though many of its suggestions are not novel, all of them are sensible, clear, and instructive. One would have to know a great deal about pyuria not to be benefited by them. C. W. D.

ART. XXVI.—*The International Encyclopædia of Surgery. A Systematic Treatise on the Theory and Practice of Surgery, by Authors of Various Nations.* Edited by JOHN ASHHURST, Jr., M.D., Professor of Clinical Surgery in the University of Pennsylvania. In Six Volumes. Vol. III., 8vo. pp. 760. New York: William Wood & Co.

In this volume we find a continuation of the study of injuries and diseases of the various tissues. Two short articles open the volume. The first, by Dr. P. S. Connor, on *Muscles, Tendons, and Fasciæ*, is excellent in quality. The second, by Mr. Bellamy, although of equal quality, leaves much to be said on the subject of morbid growths of the lymphatic glands.

The article which follows, on *Injuries of Bloodvessels*, by the late John A. Lidell, M.D., of New York, is one of the most important features of the volume, and when combined with the article on Aneurism, by Mr. Barwell, constitutes a most valuable addition to the literature of this special branch of surgery. The author's qualifications for this task are indicated in the titles appended to his name. The opportunities offered for a study of these affections in a surgical service at Bellevue Hospital, and as surgeon in charge of the Stanton Hospital, and later as inspector of the Medical and Hospital Department of the Army of the Potomac, must have been ample.

The author is of the opinion that hemorrhage is the most serious of all complications attending wounds in general, and that more lives are lost from it than from all other consequences combined. Every one who aspires to become a surgeon is admonished to divest himself of all fear, and in the words of Lister, to "learn to look boldly on the open mouths of arteries." The writer seems to us to have exaggerated somewhat the frequency with which primary hemorrhage becomes an important factor in the management of larger wounds. A military service is undoubtedly rich in the experience of this class of complications; in civil practice, on the other hand, one can hardly fail to be impressed with the comparative rarity of danger to life from hemorrhage. The most extensive and ghastly injuries, such as occur in railway accidents, appear to be singularly devoid of this popularly supposed source of danger. Nevertheless, the preliminary remarks on the importance of this subject should be thoughtfully read by every young surgeon, and the advice carefully to study recorded cases should be studiously followed. Dr. Otis is quoted as saying, "It is hardly possible to unduly multiply illustrations of the management of wounded vessels." It is indeed true "by thorough special training and by patiently fortifying himself from the experience of past generations that the surgeon acquires the boldness and positiveness, the promptness and dexterity which are demanded in the treatment of wounded bloodvessels."

It should not be forgotten, however, that the rules for treating wounds of vessels are comparatively simple, and resolve themselves mainly into the one grand principle of securing with a ligature both ends of a wounded artery. A careful perusal of the various applications of this principle as ably set forth in Dr. Lidell's article with the aid of almost innumerable cases is well worth the thoughtful attention of the reader.

The directions for action in bleeding from large vessels are judicious, and the cases cited show how much can be accomplished by direct pressure. In gunshot injuries of large vessels, several instances are given where the finger was inserted directly into the wound of the vessel, and life thus saved. The advantages to be gained by the removal of warm clots and the exposure of the bleeding surface to the air are duly insisted upon, and the worthless and even injurious action of the salts of iron, so often employed by unskilled hands, as abundantly illustrated during the late war, is forcibly pointed out. The author justly restricts the use of these drugs to cases of parenchymatous hemorrhage occurring in open wounds.

The section devoted to the repair of arteries after the application of the ligature, is exceedingly brief. Although it is evidently the intention of the author to confine himself to the more practical features of this branch of surgery, a more detailed statement of the peculiar conditions which modify the process of repair in arteries would have been appreciated by the surgeon, as well as the pathologist, and would have also added greatly to the literary value of this article. Such terms as "plastic lymph" we supposed had been consigned to the garret of surgical pathology. This want is but partially supplied in the papers which follow.

Although animal ligatures are evidently preferred by the author to all others, and it must be allowed that they fully deserve the popularity which they have attained, it should not be forgotten that fine silk or hempen thread can be, when cut short, left in the wound, with every prospect of being disintegrated and absorbed during the healing process, and at the same time afford a safer and more effectual ligature in larger and deeply seated vessels. A glance at other modes of securing vessels is sufficient to re-establish in one's mind the undisputed sway of the ligature. Sir James Simpson's reproach that the ligature left pieces of dead flesh beyond it in the wound has had the sting removed from it by Lister.

The transfusion craze seems temporarily to have subsided, probably owing to the difficulties, not to say dangers, attending the methods hitherto advocated. The experiments of the physiologists show what startling changes may be brought about in the blood of animals simply by the re-introduction of a small quantity of their own blood into the circulation by the liberation of the fibrin ferment. Such dangers have not been experienced, as far as we are aware, in the human subject. The hope that the period following a severe loss of blood may be safely bridged over, is always a good excuse for delay in performing an operation in which few surgeons have had experience. A class of cases is pointed out in this paper where the operation would be clearly indicated, examples of which came under the author's own military experience, cases in which anæmia and general debility did not yield to the most skilful treatment, the patients perishing from exhaustion a considerable number of days after the bleeding had been arrested. We have grave doubts about the value of any instrument hitherto devised for this purpose. The instrument of the future must be simple in construction and action, must be independent of the donor, and enable the surgeon to devote his whole attention to the patient.

The details of treatment in the cases of punctured wounds of arteries are carefully given; even in the case of such injury as wound of the internal mammary artery. We can offer personal experience of the difficulties attending an attempt to secure this vessel; the advice given to tampon the wound is, we presume, that which must generally be followed in these cases.

Next in order contused wounds of arteries are mentioned with the complications which may arise from an occlusion of the vessel. The advice to amputate at the point of injury in a lacerated wound as soon as gangrene appears at the toes or fingers of the extremity injured, is, we think, good, although a policy not generally recognized. No less than twelve pages are devoted to that serious accident rupture, of the axillary artery. It is interesting to note that, in thirty-four cases presented, there were but eight recoveries, and in four of these no treatment whatever was employed. The author, although he does not swerve from the old, and we believe best surgical advice, to take the bull by both horns, that is, to cut down and tie both ends of the injured vessel, nevertheless suggests elsewhere the propriety of attempting some of the various methods of compression before resorting to operative procedures. There are, undoubtedly, occasions when the latter plan would have obvious disadvantages, as in the case of laceration of vessels caused by fractures which would thus be converted into compound fractures. This objection has less weight where antiseptic precautions can be thoroughly carried out, but we presume there are few surgeons who would not resort to compression first.

The author's military experience has enabled him to give an unusually interesting chapter on the gunshot wounds of arteries. The section devoted to the wounds of veins contains many valuable suggestions. Among them we note the advice of Langenbeck to tie the accompanying artery when a large vein has been wounded and is bleeding. We had supposed it almost unnecessary to give the advice to tie the chief veins in cases of amputation, as such is to-day the almost universal custom. We do not see mentioned, however, the proposition to apply the ligature to the main trunk when symptoms of pyemia are developed, and thus cut off the supply of septic material from the putrid thrombus. We believe this advice has not yet been followed to any extent, but the suggestion nevertheless merits a trial.

Thirty cases of entrance of air into the veins are mentioned. The cause of death is, according to the author, the presence of air in the right ventricle, preventing the closure of the tricuspid and semilunar valves, and allowing the air to reach the pulmonary arteries, fatal syncope coming on from a deficient supply of blood to the brain and nervous centres. According to Cohnheim, death occurs solely from the presence of a globular mass of air in the right heart preventing contraction of the heart, which compresses slightly the air, but cannot force it onward. Cohnheim says: "When we reflect that more than one-half of the bloodvessels of the lung can be shut out from the circulation without injury to the rest, we see that genuine air embolism does not deserve the bad reputation which it has." A large quantity of air can be introduced into the veins of an animal, provided that it be introduced slowly. This is also true of fat embolism, which by the way we do not find mentioned in the article, namely: that a large amount of fat must be let loose at once to do any injury, and that death does not occur nearly so often as has been supposed from this cause.

The subjects which follow are traumatic aneurism, gangrene from

arterial obstruction, hæmophilia, and the different varieties of hemorrhage. The article closes with a chapter on the "Deligation of Arteries." Why the old term ligature, or the verb "to tie," has been so universally abandoned by American writers we fail to understand. "Ligation" and "Deligation" are, of course, intended to describe the act of tying, but "ligature" can also be used in this sense, and possesses, to ourselves at least, the additional advantage of being employed in the most classical works. "To ligature" and "to ligate" are, we presume, equally incorrect, but the latter term has always jarred upon our sensibilities as having a peculiarly pedantic flavour; but when we find that it leads to such expressions as "the ligation came away on the ninth day," a phrase which appeared recently in a leading journal, we feel that our objections are based upon something more than a mere matter of taste.

The advice to tie the larger arteries with two ligatures and to divide the vessel midway between them, so that both ends may retract within the sheath, is in harmony with the process of repair in arteries, and will be more generally adopted, we believe, when that process is better understood. This part of the article is illustrated by some excellent woodcuts taken from Sédillot, and is further enriched by the report of many valuable cases.

The subject of the next paper is the *Surgical Diseases of the Vascular System*, and is written by Dr. John A. Wyeth, of New York. The author begins with an account of phlebitis and arteritis, devoting special attention to the inflammation of arteries in syphilis, and giving the results of a considerable amount of original and histological work. It is an encouraging sign that work of this character is given a place in an English or American surgical work, indicating as it does the fact that scientific study is now clearly recognized as essential to a proper understanding and treatment of disease. Nothing could better illustrate this point than the pages devoted to syphilitic arteritis. In reading the views given by the various authors quoted, on the changes in the arterial coats in inflammation, one cannot help being struck with the prominence given to the intima as the layer chiefly concerned in the occlusion of the lumen of the vessel. An explanation may be discovered in the custom of examining chiefly transverse sections of the vessel, which naturally gives rise to the impression that the growth seen in the interior proceeds from the adjacent intima. This coat, it should be remembered, is in health a non-vascular membrane of extreme delicacy, whereas the media makes up the greater part of the thickness of the vessel wall, is vascular, and contains cell structures capable of more voluminous changes. We are of the opinion that vertical sections would show more frequent encroachments upon this interior growth from the vascular wall than are now supposed to occur. The other important features of this article are an account of cases of cirroid aneurism, the treatment of which is illustrated by tables of cases of "Carotid Ligation," and a handsome coloured lithograph, giving an accurate representation of a severe form of nævus.

The article on *Aneurism* which follows is by Mr. Richard Barwell, of Charing Cross Hospital, London. In the classification of aneurism the author proposes to discard altogether "false aneurism," and correctly, we think, if by that term are meant those aneurisms in which "one or more of the coats are no longer entire." For it is in many cases manifestly impossible to determine exactly what is the anatomical status of the walls. But in abandoning this term altogether he is involved in difficulties from which we do not think he has been able successfully to extricate himself.

The use of the term "consecutive" for those tumours in which the walls

have partly given way, but are reinforced by inflamed tissues, is confusing; on the other hand, "ruptured" aneurism, when in such an accident a barrier has not been successfully thrown up and the blood has escaped, is a term which explains itself. The difficulties increase when the author attempts to designate what is commonly called traumatic aneurism. He calls the sacculated form traumatic consecutive aneurism, and discards the term traumatic diffuse aneurism. the condition it is intended to describe being to him merely a ruptured artery with interstitial or subfacial hemorrhage. We cannot agree with the author that such conditions necessarily exclude the term aneurism. For some of them the term false aneurism would be eminently appropriate, and we think it unfortunate that the term has not been more generally associated with the traumatic form of aneurism. It is but fair to note here that the author is at pains to point out that many of the so-called idiopathic forms are, strictly speaking, of traumatic origin, being caused by a stretching and partial rupture of the coats of the vessel. It is evident that the nomenclature needs a thorough overhauling, and the author is to be credited at least with an attempt to bring order out of confusion.

Mr. Barwell does not believe in the syphilitic origin of aneurism, the large vessels in which aneurism develops preferably not being the seat of syphilitic affections. Granting the action of the endothelium in the smaller vessels in syphilis as indicated in the previous article, can we safely deny a similar action of the same tissue in the larger vessels in the disease? On the other hand, granting that the endothelium is widely affected in syphilis, will not the absence of symptoms of syphilis in most cases of aneurism indicate that the morbid endothelium is not the potent factor in the development of aneurism assumed by modern pathologists? These are questions which can be answered only when pathology has succeeded in interpreting more clearly the action of the arterial tunics in disease. The section on the diagnosis of aneurism emphasizes the important fact that there is no one symptom on which we can rely, and we find here, as well as elsewhere in this article, striking illustrations of the liability even of the most skilled diagnostician to be misled.

The medical and surgical treatment of aneurism is discussed at length, and this portion of the article forms a most valuable summary for the purpose of reference. We have little to say in the way of criticism, except, perhaps, that more prominence is given to digital pressure than it deserves, and not sufficient emphasis is laid upon the advantages of prolonged etherization in the continuous method of employing pressure. The most interesting feature is the author's account of his ox aorta ligature. This is made from the aorta removed whole from the animal, and cut spirally into tape-like strips. These are stretched and dried, and before use are steeped for an hour in a three-per-cent. solution of carbolic acid. A specimen exhibited by the author at the International Congress in London was thirty-six feet in length. The object of this flat ligature is to approximate without rupturing the walls of the artery, thus imitating, we presume, the effect produced by pressure. It is thought that the dangers of constriction, and ulceration of the walls of the vessels caused by other forms of ligature, are thus avoided. The number of cases in which this ligature has been used is limited; but thus far it has proved very satisfactory. In estimating the dangers of a particular kind of ligature we think the surgeon is liable to err in imagining the ligatured vessel, as it is ordinarily seen in museum preparations, a hollow tube nearly severed

into two separate portions at the point of ligature. A view more in accord with the actual condition of things, if the ligature has been properly applied, would be one which recognized the vessel as a tube buried in a cylindrical mass of tissue (its sheath), capable of solidification into a ligamentous cord for some distance above and below the point of the buried ligature. Ligatures which do not interfere with the rapid organization of the external tissues are as important factors in the problem as those which do not act unfavourably upon the arterial tunics. Of the observations upon aneurisms of various localities the most interesting are those relating to aneurism of the arch of the aorta. The relations of the axes of the innominate and left common carotid to that of the aorta, and the peculiar conformation of the openings of these vessels, and their influence upon the blood-stream, are strikingly illustrated by two interesting diagrams. A thorough appreciation of these points may lead, as the author intimates, to increased success in the treatment of aneurisms of the arch by distal ligature.

The frequent use of the terms which we have already criticized in a preceding article indicates, perhaps, a special adaptation by the author to the wants of the American market.

The only article contributed by a continental surgeon is that by M. Nicaise, of Paris, on *Injuries and Diseases of Nerves*. Not only is this paper interesting for its subject-matter, but also as a contrast in style with the English and American contributions. The strict adherence to traditional modes of mapping out an article has certain great advantages, and is often conspicuously absent in American writings, but in the present case a sacrifice appears thus to have been made in the terseness and vigor of style so characteristic of the best English writers. The Englishman may be weak where the Frenchman is accurate and trustworthy, but the treasures of the latter are liable to be buried in a mass of elaboration, while the former's wares are sure to be exhibited to the best advantage. In the present article, for instance, it has been thought necessary that each particular nerve affection should have its separate section for etiology, pathological anatomy, symptoms, diagnosis, prognosis, and treatment; and inasmuch as there are quite a variety of these, rapidly succeeding each other, one is in danger of losing his way in the labyrinthian sameness of succeeding pages. It is somewhat annoying to find that, after having patiently threaded one's way through a series of primary, secondary, and intermediate symptoms, central and peripheral disturbances, one is only then prepared to be told that "the first symptom experienced in consequence of an injury of a nerve is an acute pain."

The first part of the article is devoted to the varieties of injuries of nerves. Although nice distinctions are drawn between the lesions following crushing, contusion, etc., we fail to find a satisfactory account of the lesions produced by special kinds of injuries, as those met with in railway accidents; for example. There are, however, many excellent features, chief among them being an account of the regeneration of nerves, of nutritive disturbances following nerve injury, and the neuro-paralytic inflammations. The question of the agency of nerve section or injury in producing inflammation is well exposed, and discussed with much fairness. We are not, however, prepared to accept the position apparently taken by the author that the inflammatory changes are not due to nerve lesions. Following an account of neuralgia and nerve tumors is a section devoted to tetanus. The author discusses both the humoral and the nervous theory

of the disease without committing himself to either. The uncertainty of pathological changes is dwelt upon. "The most frequent lesions are those of the spinal cord, but even these may be absent." In discussing the influence of treatment on the disease, he is not inclined to confine its efficacy merely to the relief of pain and asphyxia, but reckons it at its true value, we think, in stating "that treatment may make chronic some cases of tetanus which have begun as acute." Chloral is placed first on the list of remedies, and neurotomy is mentioned favorably as an operative procedure. The closing pages on nerve stretching, suture of nerves, neurotomy, and neurectomy are valuable and interesting.

The closing article of this volume is on *Injuries of the Joints*, by Dr. Edmund Andrews, Professor of Clinical Surgery in the Chicago Medical College. It is well up to the standard of this volume, and is freely illustrated with a good selection of old wood-cuts and many new ones. The greater part of the article is devoted to dislocations, but there are also numerous additional features of interest. The section on bone-setting is one of the best of these. The treatment of sprains is based on sound principles, although we find here the inclination to make applications to the injured joint. The value of rest and the benefits of *massage* are, however, duly dwelt upon. The account of management of incised wounds of the knee-joint is also excellent. Gunshot wounds of the joints are given all the space which the author could allow to that subject, and perhaps as much as could be expected, as they are already included in an article on gunshot injuries in a previous volume.

In conclusion, we may add that this volume is on the whole fully equal if not superior to either of its predecessors, and cannot fail to win a prominent place for the Encyclopædia in surgical literature. J. C. W.

ART. XXVII.—*Voice, Song, and Speech: A Practical Guide for Singers and Speakers, from the Combined View of Vocal Surgeon and Voice Trainer*. By LENNOX BROWNE, F.R.C.S. Ed., Senior Surgeon to the Central Throat and Ear Hospital, Surgeon and Aural Surgeon to the Royal Society of Musicians; and by EMIL BEHNKE, Lecturer on Vocal Physiology and Teacher of Voice Production. With numerous illustrations by wood-engraving and photography. 8vo. pp. xiv. and 317. London print. New York: G. P. Putnam's Sons, 1884.

MR. LENNOX BROWNE is well known in medical circles as a prominent London laryngologist, and Mr. BEHNKE is equally well known in musical circles as a prominent teacher of vocal culture. Both authors have issued small works on the voice, which have been favourably received. In the work before us they have united their labours to produce an original volume which marks an important epoch in the study of the voice. Mr. Browne's rare artistic skill supplements his professional observations to great advantage; and Mr. Behnke's self-command over his throat and larynx affords unusual facilities, not only for submission of the vocal organs to the inspection of others and to auto-inspection, but for utilization of the camera and the preservation in photographic reprints of the demonstrations he is able

to make of the living parts in action. The difficulties overcome in photographing the larynx have been immense, and although the pictures are much less distinct than ordinary photographs, and necessarily a little out of line, they are sufficiently defined to permit a recognition of things as they are, in preference to sketches of things as they are seen. We must confess to some disappointment in the flatness of the photographic pictures. They are as flat as any hand pictures; and it must therefore be presumed that the failure of artists to represent the larynx in depth as well as in superficies has been due to physical laws which limit the scope even of photographic pictures.

While these pictures represent the best results obtained by the photographic process, their production is attended with so much cost and labour that we must trust to some simpler process, more like that pursued by Dr. French of Brooklyn, for photographs of the morbid larynx. The competition on the two sides of the Atlantic, ere long, may culminate in something permanently practical.

In addition to the photographs of the laryngoscopic image, a number of photographs of the mouth are given in order to show the positions of the palate, uvula, and tongue in the production of tones in different portions of the register. This is a new feature, and one which bids fair to modify prevailing views on the mechanism of *timbre* or quality of voice.

The photographs of the larynx in phonation are strongly confirmative of the mechanism of voice production announced many years ago by Mme. Emma Seiler of Philadelphia, as the result of her own laryngoscopic observations. The terms used, in the present work, *thick*, *thin*, and *small*, to designate the different registers of the voice, correspond practically to those employed by Mme. Seiler, *chest*, *false alto*, and *head tones*, to designate the different portions of the vocal register; the transition points being identical. It may be added that Mme. Seiler's announcement that the vocal bands (vocal cords) vibrate in their entire width during the use of the chest tones of the register, and that their edges alone vibrate when the false alto tones are used, is confirmed by a similar explanation of the thick and thin registers of our authors. Furthermore, these thick and thin registers are subdivided into upper and lower, as are the corresponding portions of the register in Mme. Seiler's work.

The work before us goes into an exposition of the laws of sound; the anatomy and physiology of the organs of the voice; the hygiene of the voice; the proper and improper use of the voice; the diseases that impair the voice; stammering and stuttering; laryngoscopy; and a few cognate topics. All these subjects are well considered, and are presented to the general reader in a satisfactory and intelligent manner. To amateur vocalists the work is of inestimable value. Professional vocalists and teachers cannot study it without benefit. The illustrations are admirable, the type attractive, and the style comprehensible. Exception might be taken to many terms used, such as vocal-surgeon, voice-box, buffer cartilages, and similar attempts at vulgarization. This is altogether a matter of taste, and does not impair the value of the work. It is indirectly intimated that the cartilage of Wrisberg, which seems to stiffen somewhat the soft lateral wall of the larynx, has a horizontal arm which pierces the vocal ligament (vocal cord) posteriorly. This horizontal strip of cartilage, however, is but the vocal process of the arytenoid cartilage; and, though it has been described as a special cartilage, we were unaware that it had ever been described as a part of the cartilage of Wrisberg. J. S. C.

ART. XXVIII.—*Transactions of the American Ophthalmological Society. Nineteenth Annual Meeting.* 8vo., pp. 616. New York, 1883.

DR. HASKET DERBY, of Boston, contributes a paper on *The Influence on the Refraction of Four Years of College Life; Illustrated by the Statistics of the Last Four Classes Graduating from Amherst College.* The refraction was traced through the whole term of four years, in the cases of 254 students, whose average age was 19 at entrance and 23 at graduation. The results obtained furnish the following percentage:—

| | At Entrance. | At Graduation. |
|-------------------------|--------------|----------------|
| Hypermetropia | 15.4 | 18.5 |
| Myopia | 35.4 | 47.2 |
| Emmetropia | 49.2 | 34.3 |

The average degree of hypermetropia was the same at graduation as at entrance; the average increase of myopia in the myopic cases was 0.6 dioptrics; and in the 23.2 per cent. of emmetropic cases in which myopia was developed, the average degree was 1 dioptic. The degree of hypermetropia developed in 8 per cent. of the emmetropic cases is not stated. This is to be regretted, as this result is contrary to general experience, and a low degree of hypermetropia might very probably have been latent at the first examination and manifest at the last.

The author claims that his observations tend to show that nearly one-half of the educated community in this country, as well as in others, is myopic after twenty years of age; and that, contrary to the general impression, myopia may be acquired at this time of life from the same causes that produce it at an earlier age, and may continue to progress until the course of study is completed.

These statistics are interesting and suggestive; but, as was pointed out in the discussion, the results of such examinations cannot be considered conclusive in the absence of artificial paralysis of the accommodation.

DR. RUSSELL MURDOCH, of Baltimore, showed *Some Improvements in Instruments and Appliances for Cataract Operations*, consisting of a *speculum*, in which the usual spring is substituted by a vertical bar, to which one blade is firmly attached, while the other blade slides upon it by means of a canula; a small *ophthalmostat*, adapted for attachment to the lower bridge of the speculum; a combination of a Graefe knife and Wecker scissors in the same handle; and a combination of iris forceps with cystotome and shell spoon.

DR. H. S. SCHELL, of Philadelphia, reports *A Case of Tubercle of the Iris* occurring in a boy nine years of age who had a well-marked family history of phthisis, and was suffering with coxalgia. The left eye had been affected with plastic iritis for several months, when a yellowish-white nodule, tinged with pink, the size of a pin's head, was noticed on the nasal side of the pupillary margin. This new growth increased in size until, at the end of six months, the anterior chamber was nearly filled with it. The intraocular tension was increased, and the eye was tender. The eye was enucleated, and microscopic examination showed two or three tubercular masses imbedded in a mass of inflammatory product.

A Case of Tuberculosis of the Ciliary Body and Iris is reported by DR. O. F. WADSWORTH, of Boston. The patient was a child three-and-a-half years of age. There were keratitis and iritis, and a yellowish

reflex from the pupil was visible. The case seemed to be one of glioma or irido-choroiditis. Six weeks after the first examination it was found that the disease had advanced with great rapidity; there was a staphyloma of dark colour in the ciliary region, no trace of the iris was visible, and a growth reached forward nearly to the cornea. The growth was yellowish-white, and contained numerous bloodvessels and some hemorrhages. The eye was enucleated, and the anterior part of the globe was found to be occupied by a solid grayish mass. There was no sign of the lens. Microscopic examination, after hardening in Müller's fluid, showed the mass to be made up chiefly of granulation tissue, in which were large bloodvessels and remains of hemorrhages. Throughout this tissue were scattered agglomerations of cells characteristic of tubercle. The presence of the bacillus of Koch was demonstrated in the specimen.

The child died, about six months after the operation, of tubercular meningitis; and it was afterwards learned that its father and uncle had phthisis.

In the discussion several cases were referred to illustrating the difficulty of distinguishing tubercular disease behind the iris from glioma or choroiditis.

Dr. S. F. MCFARLAND, of Oxford, N. Y., recounts *A Personal Experience with Prismatic Glasses*. During boyhood he had occasional slight divergence, but did not suffer from asthenopia until after an attack of typho-malarial fever. Binocular vision was then lost entirely, and reading became almost impossible. Prisms of 7° each, bases inwards, enabled him to read and to attend to professional work with comparative comfort, and he has continued their use for more than seventeen years.

Dr. O. F. WADSWORTH, of Boston, explains *The Apparent Curvature of Surface produced by Prisms*. As this is a mathematical demonstration by means of diagrams, it does not admit of a summary, and the reader who is interested in the subject must be referred to the original.

A Case of Sympathetic Neuro-Retinitis, reported by Dr. JAMES A. SPALDING, of Portland, Maine, is particularly interesting from the fact that the other tissues of the eye were unaffected, and the neuro-retinitis did not, therefore, admit of the suspicion of being merely a complication, which has weakened the evidence of a large proportion of the cases hitherto reported. Good vision was restored by enucleation of the injured eye, although the operation was not performed until after the sympathetic disease was well advanced.

Dr. DAVID WEBSTER, of New York, reports *Thirty-Five Cases of Cataract Extraction* by the method of operating known as "Von Graefe's modified." Considering $V = \frac{2.0}{2.00}$ as a good result, his statistics give 90 per cent. of successes; $3\frac{1}{2}$ per cent. of partial successes; and $6\frac{2}{3}$ per cent. of failures. Preliminary iridectomy was performed in six cases, two of which did badly. A full record is given of each case. Ether was given in most of the cases.

In some *Notes on Ocular Therapeutics*, Dr. W. W. SEELY, of Cincinnati, gives a favourable report of his experience in the use of yellow oxide of mercury and eserine in corneal affections.

Dr. W. F. MITTENDORF, of New York, reports some cases of *The Treatment of Detachment of the Retina*, with good results, by means of rest in bed, pressure bandage, and pilocarpine.

Two Cases of Ectopia Lentis, Congenital, Double; One Case Non-Symmetrical, the other Symmetrical, are reported by Dr. W. S. LITTLE, of

Philadelphia. There was no defect in the iris in either case. The vision was much improved in both by proper correction with glasses.

Dr. GEO. T. STEVENS, of New York, recommends *The Employment of Nitrous Oxide as an Anæsthetic in Ophthalmic Operations*.

Dr. ALBERT G. HEYL, of Philadelphia, in *A Contribution to the Operative Treatment of Glaucoma*, discusses an operation which he had performed in a case in which an iridectomy previously done on the other eye had been followed by intra-ocular hemorrhage. He supposes an impairment of the contractile power of the intra-cranial carotid, and with the object of reducing the amount of work required of this artery, by isolating from it a part of the area which it supplies, he ligated the fronto-nasal and supra-orbital arteries.

Dr. G. HAY, of Boston, contributes *Some Additional Remarks on the Theory of the Astigmatic Pencil*, which do not admit of condensation.

Dr. CHARLES J. KIPP, of Newark, N. J., reports *Four Cases of Sarcoma of the Uveal Tract*. In two the growth sprang from the ciliary body and iris, and in two the choroid was its seat. In all there were increased tension, pain, and other glaucomatous symptoms. In one, the only objective sign of disease when first examined was a localized opacity and swelling of the retina in the region of the macula. Nearly two years afterwards symptoms of acute inflammatory glaucoma appeared, and a sarcomatous growth filled the posterior half of the vitreous chamber. In one of the cases involving the ciliary body and iris, the patient remained free from any signs of return of the disease nine years after enucleation was performed.

Dr. Kipp also reports a case of *Ossification of the Choroid*, occurring in a man twenty-two years of age. The eye was congenitally blind, with a chalky cataract and an atrophic iris and divergent strabismus. The eye remained free from any signs of irritation until a short time before the enucleation. There was a thick shell of bone over the whole inner surface of the choroid, extending to the ciliary body.

Dr. SAMUEL THEOBALD, of Baltimore, reports *Two Cases in which "Trituration of the Cortex" was practised in Connection with Preliminary Iridectomy, to Hasten the Development of Slowly Ripening Cataracts*. This proceeding was recommended, a year or two since, by Professor Förster, of Breslau. It consists of performing iridectomy and then bruising the lens by pressing the cornea against it with the convexity of a strabismus hook or cataract spoon. In one of Dr. Theobald's cases the operation was only partially successful, but in the other a rapid development of the cataract resulted. Several other members of the society gave their experience in the operation, which was generally favourable, though in a few instances iritis was induced.

Dr. Theobald also recommends *Vaseline Cerate as a Convenient Basis for Ointments intended for Application to the Eyelids*. The cerate is prepared by melting vaseline and yellow wax together.

A Case of Blindness from Retinal Thrombosis in Consequence of Facial Erysipelas is recorded by Dr. H. KNAPP, of New York. The erysipelas began in the nose and extended to the pharynx, cheeks, and orbits. On the fifth day, after the general symptoms had abated, chemosis and exophthalmos made their appearance. In a few days the sight was impaired and was soon lost entirely. Ophthalmoscopic examination showed a "milky retina, pervaded by numerous dark, almost black, tortuous, over-filled bloodvessels, which converged to a common centre, and had upon

and between them many irregular dark hemorrhages. The character of all the vessels was the same; they appeared as enlarged veins." The author compares the appearances presented to those seen after resection of the optic nerve. He considered the condition to be "complete obstruction of the central retinal artery by compression from the swollen and hardened cellular tissue of the orbit." Finally, the optic disks were atrophied, and almost all the bloodvessels were converted into white streaks. The retinal tissue was transparent, with white patches, especially in region of yellow spot.

Dr. W. H. CARMALT, of New Haven, describes *Changes in Refraction Resulting from a Blow*. A man, aged twenty, who had been myopic since twelve years of age, had fallen forward, striking his right eye upon a bolt projecting from the floor. He found afterwards that he could see at a distance better without the concave glass (-4.50) which had given him perfect vision before the accident; and examination, under atropia, showed a refraction of $-7.5 = + 1.50 = \text{ax. } 80^\circ$; with full sight. The author suggests five possibilities that might account for this change: "1st, a change in the shape of the cornea; 2d, a diminution or shortening of the axis of the globe; 3d, a displacement or dislocation of the lens backwards; 4th, a pre-existing spasm of accommodation, the tonicity of which had been released by the paralytic effect of the blow; 5th, a change in the relative positions or arrangement of the lenticular fibres."

Under the head of *A Case of Blepharoplasty according to the British Method*, Dr. C. GRUENING, of New York, describes an operation for the cure of ectropion, by means of the transplantation of a flap of skin without a pedicle, as recommended by Wolfe. As the result of a severe and extensive burn, the upper lid was everted, and its free border was attached to the supra-orbital margin, while all the surrounding integument was changed into a cicatricial tissue.

The border of the lid was freed from its attachments and united by sutures to the border of the lower lid, and the wound thus made was covered with a flap of skin taken from the upper arm. This flap, which measured two and one-sixth inches in one direction and one and three-fifths in the other, was accurately adapted to the wound, and held in place with gold-beaters' skin, a pad of borated cotton, and a compress bandage. Only a small circular spot, three twenty-fifths in diameter, sloughed, leaving an ulcer which healed in a few weeks. A month afterwards the flap had shrunk in size to one inch and one twenty-fifth by three-fifths, but eight months later there had been no further contraction. The sutures uniting the edges of the lids were allowed to remain twelve days.

Dr. EUGENE HOLT, of Portland, Maine, discusses the question of *Comotio Retinæ*; or *Some of the Effects of Direct and Indirect Blows to the Eye*. He refers to the views of different authors on the subject, and reports four cases in which blows were followed by a high degree of temporary loss of vision, without ophthalmoscopic changes, or any indications of orbital or intra-cranial lesion.

Dr. CHARLES S. BULL, of New York, reports *Two Cases of Ophthalmoplegia Externa, associated with Disease of the Optic Nerves, from Brain Tumour, with an Account of the Post-mortem Examination*. In one, "an examination of the muscles of the eyes showed on the left side a complete paralysis of the internal and superior recti muscles, partial paralysis of the inferior rectus, and an apparent defect in the action of the superior oblique muscle. On the right side there was complete

paralysis of the internal rectus only." There was also papillitis in both eyes, and a central scotoma in the field of the left. At the autopsy, a cystoid tumour, as large as a walnut, was found in the right ventricle attached to the anterior end of the choroid plexus.

In the other case there was complete paralysis of both third and sixth nerves. No scotoma, and no decided change in the fundus of either eye. A gummy tumour, the size of a pigeon's egg, was found in the right middle cerebral lobe.

G. C. H.

ART. XXIX.—*Porro's Operation*. By CLEMENT GODSON, M.D., Consulting Physician to the City of London Lying-in Hospital; Assistant Physician-Accoucheur to St. Bartholomew's Hospital. Quarto, pp. 20, with Two Lithographic Illustrations. Reprinted from the *British Medical Journal*, Jan. 26, 1884.

THROUGH the kindness of Dr. Godson, we are in receipt of a special copy of his valuable contribution to the literature of the Porro-Cæsarean section, which is certainly the most complete of all the papers that have treated of this operation, especially in its tabular record, which is a marvel of painstaking labour and accuracy, and gives a satisfactory record of each individual case, under nineteen heads.

As there is nothing new under the sun, we find that the idea, which reached its full fruition under the hand of Dr. Porro, was in the minds of several authors and experimenters, dating back to 1768, when Dr. Joseph Cavallini, after removing the uterus of a bitch, which contained nine puppies, wrote as follows: "I do not doubt that the uterus is not at all necessary to life; but whether it may be plucked out with impunity from the human body, we cannot be certain, without a further series of experiments of this kind, which perhaps, a more fortunate generation will obtain." Forty-one years later (1809), Dr. G. P. Michaelis, of Marburg, wrote: "It is, indeed, a question, whether the Cæsarean section would not be made less dangerous if with it were combined the extirpation of the uterus." D. James Blundell, of London, in 1828, after saving three out of four rabbits after hysterectomy, wrote to the same effect, and added: "Perhaps this method of operating may prove an eminent and valuable improvement." Other experimenters at later periods reached the same conclusion, with Dr. Porro as one of them, who was the first to practise upon the human female what had so long been held as practicable, but never acted upon.

As a thorough, reliable, and complete statistical record, we have no hesitation in giving this monograph pre-eminence. There are those who are inclined to decry the value of statistics, because of their not representing the whole of the cases; but there can be no such excuse in this instance. The record then being perfect, we have only to classify the cases, and ascertain from them what is the legitimate mortality of the operation; and this we shall now proceed to do.

There have been one hundred and fifty-three operations of different types performed, which have been all reported as Porro cases; but a large number are not properly entitled to the name, and only add to the

mortality of the balance. The operations performed after the model set by Prof. Porro, who has saved four women and five children out of five cases, and the modification made by Prof. Müller, which has saved a larger proportion in the general average, or nineteen out of thirty-six women, may be considered as Porro-Cæsarean sections: but these two forms, as again modified by Prof. Gustave Veit, of Bonn, we propose, on account of their largely increased fatality, to exclude from the list. By a somewhat singular coincidence, three operators appear to have at very nearly the same time conceived the plan of dropping in the stump of the cervix after ligating it; and we find cases 50, 51, 52, and 53 in order, to have been of this character, and all operated on in a period of thirty-three days. Prof. Veit led off on March 21, 1880; Prof. Isaac E. Taylor, of New York, followed, on April 8th, supposing that his was the initial case; and Dr. Heussner, of Barmen, Germany, repeated the trial on April 15th and April 23d. These operations having all been fatal, the next four experiments covered a period of a year, and Prof. Veit was fortunate enough to save the only woman of the four. This was the sixth on the Veit list; the next saved was the twelfth, and the last the thirteenth; since which, during a period of two years, there has not been a pedicle dropped in, and it is to be hoped there will not be another, as one of the chief reasons for cutting away the uterus under the Porro plan was to avoid the risks consequent upon the presence of an open wound within the closed abdomen after the old operation, with the possibility of its discharging septic matter into the peritoneal cavity. But for the size of the cervix in labour, and the shrinkage to be expected in the process of sub-involution, the *stump* might be treated as a *pedicle* and dropped in, with a hope of safety; but its anatomical character spoils what might otherwise be a neat and very desirable way of terminating the operation, and of thus avoiding the drawing in of the cicatrix and traction upon the vagina. The comparative results of the three methods enumerated will be seen in the following table:—

| No. | Form of operation. | Cases. | Women lost. | Women saved. | Children saved. | Children still-born. | Children moribund when extracted. | Twins extracted. |
|-----|---------------------------|--------|-------------|--------------|-----------------|----------------------|-----------------------------------|------------------|
| 1 | Strictly Porro operations | 90 | 49 | 41 | 71 | 17 | 3 | 2, moribund |
| 2 | Porro-Müller “ | 36 | 17 | 19 | 28 | 7 | 2 | 2, saved |
| 3 | Either: modified by Veit | 13 | 10 | 3 | 10 | 3 | 0 | |
| | | 139 | 76 | 63 | 109 | 27 | 5 | |

Rejecting the fatal experiments of Veit and others, we have left the following:—

Porro and Porro-Müller cases, 126: Women saved, 59, or 46 per cent.; Children saved, 99, or 78½ per cent. Again, reducing the number of 126 cases to those regarded as not markedly unfavourable for the operation, and we have 83, with the following result: Women saved, 48—lost, 35; Children saved, 79; stillborn, 5. An examination of Dr. Godson's tables in the column, headed “*condition of woman at time of operation*,” will show how very unjust it would be to attribute the results following the operation in all cases to the operation alone. Passing down the column, we find noted the following conditions of the patients subjected to the

knife, viz., "*Exhausted by malignant disease.*" "*Albuminuria and eclampsia.*" "*Exhausted by malacosteon.*" "*Almost moribund from bronchial catarrh.*" "*Suffering severely from bronchitis.*" "*Very unfavourable; repeated eclamptic fits.*" "*Deplorable.*" "*Very unfavourable, patient leprous.*" "*Exhausted from long labour—version and craniotomy attempted.*" "*Hopeless—woman dying from typhus pellagrica.*" "*Patient affected with peritonitis.*" "*Patient affected with albuminuria,*" etc. It is hardly necessary to say that these women all died.

In calculating the risks of the Porro operation, we must consider the true danger of the operation itself, as shown after its performance upon a series of cases in a reasonably fair condition of health. Skill and carefulness are certainly rewarded with success, as shown by the results in several hospitals, and in the practice of several well-known operators; thus, Prof. Porro, of Milan, has saved four women out of five; Dr. Fehling, of Stuttgart, the same; Prof. Breisky, of Prague, four out of four; Prof. Carl Von Braun-Fernwald, of Vienna, saved eight out of twelve, one of the four deaths following the dropping in of the pedicle. This experiment was tried four times in the Krankenhaus, and all of the women died. In Santa Caterina Hospital of Milan, nine women out of twelve have been saved, and all of the children; six of the women were saved in succession, and there was but one death in the last ten cases, which was due to strangulation of the intestine from adhesion of a knuckle to the cicatrix of the abdominal wound, a cause by which a Cæsarean case was once lost in this city under Dr. Walter F. Atlee. The general mortality of the Porro operation in 1883 amounted to only nine cases out of twenty-one a saving of fifty-seven and one-seventh per cent.

To Dr. Godson is due the credit of having performed the first successful Porro operation at a viable period of gestation in Great Britain. This was done on November 27, 1882, when the patient had reached the 263d day of her pregnancy; in a private house in Islington, London. The subject was a dwarf 4 feet 4 inches in height, and 24 years of age, whose pelvis was much deformed by her having been run over by a dray when four years old, whereby she received a fracture involving the pubic bone of one side and tuber ischii of the other, from which numerous fragments were removed. As the operation was performed in a somewhat novel manner in some of its features, we give a description of it in the words of the author.

"The abdomen was first sponged with carbolic acid solution (1 in 40), the carbolic spray turned on, and after passing a catheter, to be sure that the bladder was empty, and to note its exact position in the abdomen, I commenced my incision. . . . The uterus being exposed, its anterior surface was noticed to be very livid in appearance, suggesting that the placenta was attached to the anterior wall; and therefore I made, as low down as possible, that is, at about the junction of the lower with the middle third, a small incision just large enough to admit the finger; a gush of venous blood occurred and the membranes were seen. I immediately inserted the tips of each forefinger, and tore the womb open transversely. There was no resistance. The membranes were not ruptured by this manipulation; therefore, knowing the exact position of foetus, I thrust my hand through them into the right iliac region, and seizing the neck, without difficulty extracted the child. As it did not at once show signs of vitality I dashed some of the carbolized water, in which the instruments were, over its face and chest, and it almost immediately cried lustily."

While Dr. Godson was engaged with the child, Mr. Knowsley Thornton slipped his left hand into the pelvis; grasped the neck of the uterus to control the hemorrhage; and then with the right, applied the wire of Kæberlé's *serre-nœud*, so as to include the uterus, tubes, and ovaries at about the level of the internal os. The wire being then tightened the uterus with the placenta in it was cut away with scissors. Solid perchloride of iron was applied to the stump, and two pins passed across each other above the wire of the *serre-nœud*, and a strong silk ligature tied beneath them for greater security. The wound was then sutured with china-silk, and dressed with carbolic gauze, and a flannel bandage over it. Time of whole operation, from incision, to end of suturing, 42 minutes.

The child, a female, whose picture with that of the mother is in the possession of the reviewer, was twenty inches long and weighed $8\frac{1}{2}$ pounds. The mother made a good recovery, and on August 1, 1883, was apparently in perfect health. At that time her abdomen showed hardly any scar, and there was no depression where the pedicle was placed. Having largely developed mammæ she was able to nurse her infant, which was still living several months after the operation.

R. P. H.

ART. XXX.—*Health Reports.*

1. *Annual Report of the National Board of Health for the Fiscal Year ending June 30, 1883.* Washington. Pamphlet, pp. 102.
2. *Fourth Annual Report of the State Board of Health, Lunacy, and Charity of Massachusetts, 1883. Supplement containing Report and Papers on Public Health.* Boston. Pamphlet, pp. 260.
3. *Eleventh Annual Report of the Board of Health of the City of Boston.* Boston, 1883, pp. 108, pamphlet.
4. *Report of the Board of Health of the State of Louisiana for the Year 1882 and First Six months of 1883, with numerous Tables, Lithographic and Chromo-Lithographic Plates.* Baton Rouge, 1883. Pamphlet, pp. 637.
5. *Fifth Biennial Report of the State Board of Health of Maryland.* January, 1884. Annapolis. Pamphlet, pp. 275.
6. *Second Biennial Report of the State Board of Health of Iowa.* Des Moines, 1883, pp. 417.

1. THE scanty proportions and correspondingly meagre record of work of the *National Board of Health Report* exhibit a lamentable example of atrophy for want of sufficient material support which must be deeply deplored by every consistent advocate of sanitary science.

From the account of the operations of the Board we find that in consequence of the reduction of the total appropriation (including \$50,000 for the maintenance of quarantine stations) to \$67,500 for the fiscal year ending June 30, 1883, the publication of the valuable weekly *Bulletin* and the prosecution of the important investigation into matters relating to the public health, which promised so much benefit to suffering humanity, were suspended. On the same day when it was decided that these regrettable economies were necessary, the Board met with the additional misfortune of losing the name and world-wide fame of Dr. J. S. Billings, U. S. A.,

and the active services of Dr. T. M. Turner, U. S. N., the latter also resigning at the close of the year.

Dr. Charles Smart was detailed to fill the vacancy from the U. S. Army, and Dr. J. M. Brown from the Navy. Col. Geo. E. Waring was appointed instead of Dr. C. F. Folsom, resigned, and Assistant Attorney-General Thomas Simons was assigned to the place upon the Board of Solicitor-General Phillips, relieved at his own request.

Finally, Congress having limited the expenditure of the Board for this current fiscal year (1883-84) to \$10,000 for the pay and personal expenses of the members, the hospital and other property for want of funds to maintain them were tendered to the President to be used for the public good, and by his direction, through the Secretary of the Treasury, ordered to be turned over to the Surgeon-General of the Marine Hospital service.

The remainder of the pamphlet is chiefly devoted to an account of the work of the National Board of Health during the four years of its active existence, much space being given to a very temperate discussion of the difficulty with the Louisiana State Board of Health, especially in regard to establishing a quarantine station at Ship Island, which has already been referred to in our columns.

We regret most profoundly that men, and alas that we should be obliged to admit it, even physicians, who were not magnanimous enough to sacrifice sectional jealousy to the philanthropic cause of public hygiene, should possess sufficient political power to cripple this precious organization. Yet we cannot but indulge the hope that as popular opinion is more thoroughly educated up to a full recognition of the fact that care of the public health is the first duty of governments, we shall see the National Board reinvested with all and more than all its original powers and influence, and placed upon such a firm financial basis that it can freely and uninterruptedly pursue its benevolent labors towards diminishing the sad sum total of human suffering in our world.

2. The valuable essays published in the *Massachusetts Report* show that sanitary science, although sorely wounded four years ago in its first landing-place upon American soil by the inimical action of the State Legislature, has commenced to revive a little, and may again exhibit in this commonwealth the vigor and energy which made the earlier health reports from the old Bay State so useful and so famous.

The Adulteration of Food, by Prof. S. P. SHARPLES, forms the first article in the volume, and will prove a welcome messenger to those who live miserably in anxious fear lest they should be poisoned by some impurity in their diet. The author asserts that the extent to which adulteration is now practised has been overestimated, especially as to such products as are injurious to health, by far the greater number being such as are fraudulent simply from a commercial point of view. Among the most important articles investigated were, butter which is largely substituted by oleomargarine with advantage to the consumers of low-priced butter, as only the purest untainted fats can be used in its manufacture; flour, which he declares is rarely adulterated in this country; and milk in the analysis of which he advocates the employment of Wanklyn's plan of detecting adulteration by testing for the amount of cream, specific gravity, total solids, fat, sugar, ash, and caseine in every case. He states that on such a basis as this, the English analysts report and ask for conviction on as low as seven or eight per cent. of water added to the milk.

Dr. B. JOY JEFFRIES, the well-known authority on ophthalmology, con-

tributes a valuable paper entitled, "*Our Eyes and Our Industries*," which describes in detail some of the causes which, if allowed to operate unchecked, produce defective eyesight among scholars in the various public and private schools.

An essay on "*Leprosy as related to Public Health*," compiled by Dr. SAMUEL W. ABBOTT, health officer of the Board, gives the history of a patient who died in Salem almshouse of this horrible disease which he had contracted in the Sandwich Islands, and follows up the account of this case with an interesting article upon the malady which it is wisely urged should be at once prevented by legal enactments from obtaining a foothold in this country as it now threatens to do. A copious bibliography of the subject is appended.

The reports of the water boards, commissioners, and companies in Massachusetts to the number of seventy-one, and a locally valuable paper on the "*Sewerage of Nahant*" conclude the work.

3. The *Boston* Report states that the sanitary condition of the city for the past year "has been altogether satisfactory," although how this can be truthfully stated by any devoted sanitarian whilst so many cases of zymotic disease appear in the death register, we are at a loss to conjecture. Still it is encouraging to find that the number of deaths from preventable causes is decreased, that there has been nothing approaching an epidemic, and that the total death-rate (21.90 per 1000), and the rate of infant mortality are both lower than for several years past.

Only twenty-four cases and eight deaths from smallpox are reported, and this comparative immunity, in spite of constant intercourse with other large cities, where variola has been alarmingly prevalent, is attributed to the efficient legislation under which the Board of Health is enabled to enforce prompt measures for isolation, thorough vaccination, and careful fumigation of infected premises and clothing. The most serious zymotic disease appears to have been diphtheria, of which there were 1386 cases with 458 deaths, a mortality of nearly 32 per cent. Inspection of the premises upon which over 1300 of these cases occurred showed a bad sanitary condition in 952 instances, 883 of these being examples of defective drainage. The investigations of E. W. Bowditch in East Boston, in regard to 1073 cases of diphtheria reported in five years, tend to confirm the opinion that congregating children together in schools actively promotes the spread of diphtheria. In accordance with this view, and as a partial corrective of the evil, an effort was made to have the school houses periodically fumigated, but without success.

The inspection of house drainage gains, it is stated, new and increasing interest from year to year, and over 35,000 defective drains and deficient trappings have been overhauled for repairs during 1882. In one section, for example, of 74 houses, bad odours were detected in 35, and in 33 defective drains were discovered. The number of houses ordered to be vacated during the year was 123, of which number only 15 were actually deserted, the remainder being put in order with sufficient promptness. Brief reports from the city and port physicians conclude the book, which bears testimony to a great amount of diligent attention to the multifarious details of hygienic care for the well-being of a large community.

4. The *Louisiana* Report forms a bulky volume, swollen with plates, and turgid with tables, which represent a vast amount of faithful work in the good cause of sanitary science. It is everywhere pervaded by the indefatigable spirit of the President, Prof. Jos. Jones, to whose battle with

unsanitary conditions at home, and pestilence from abroad, we can heartily wish all the success we deprecated in his deplorable contest with the National Board of Health.

From the introduction we find that the death-rate in New Orleans for 1882 was for whites 21.89, and for coloured 39.03, or for a total (estimated) population of 223,555, the entire death-rate was 26.45, which, though much higher than that of Philadelphia or London, is almost identical with that of New York, and far below those of Vienna, Munich, and some other continental cities.

This favourable exhibit is attributed to the absence of yellow fever as an epidemic, the systematic house to house inspection, and domestic sanitation, carried forward under the direction of the Board of Health, and also to the prompt removal of the garbage and fecal matters of the city, and the systematic discharge of these offensive materials into the Mississippi River.

The total deaths from smallpox during 1882 were 415, of which 116 were whites and 299 blacks. As the white population is nearly three times as numerous as the coloured, these figures indicate a death-rate from variola almost nine times as great among the negroes. Dr. Jones asserts that this enormous difference in the mortality is "due solely to the neglect of vaccination on the part of the coloured population." We regret to find that the grand remedy for the arrest of smallpox, *compulsory vaccination, urged* by the President of the Board, is still persistently neglected.

The number of vessels inspected at the Mississippi Quarantine Station during 1882 was 998. On these were found 21 sick persons, of whom three died. The cases were referred to the various forms of malarial paroxysmal fever. "No case of yellow fever occurred at the Mississippi Quarantine Station during 1882." A large part of the introductory chapter is taken up by an interesting essay upon the Theory and Practice of Quarantine, both in Europe and America.

Section second is devoted to an outline of the medical history of the State, and of legislation in Louisiana relative to the practice of medicine and surgery, etc. etc., and contains a great amount of information, possessing much local interest.

From the mortality reports in section third we find that out of a total of 5922 deaths, scarlatina caused 46, typhoid fever 74, yellow fever 4, malarial fevers 409, and phthisis 857. The malarial fevers were during 1882 relatively more fatal among the blacks than the whites, a fact contrary to the usually received opinions upon this point. The large number of deaths from phthisis (over 14 per cent.) in a city so far south as New Orleans is worthy of note. Its relatively great prevalence is not explained by Dr. Jones, who considers at some length the doctrine of its causation by the *bacillus tuberculosis* of Koch, and the rival theory as to the origin of phthisis propounded by Dr. Formad of Philadelphia.

In response to an invitation from the Secretary of the Fourth International Hygienic Congress held at Geneva, Switzerland, in September, 1882, Dr. F. Formiento, a member of the State Board of Health of Louisiana, attended that convention, and presented an excellent paper upon the subject of yellow fever, which, with the delegate's interesting account of the Congress, is given in full in section fifth of this report.

As yellow fever, if not a native, is a naturalized citizen of New Orleans to a greater extent probably than any other portion of the United

States, Dr. Jones has enjoyed pre-eminent advantages for investigating it. Hence the general outline of the symptoms and pathological anatomy of yellow and malarial fevers, contained in his concluding article "On Contagious and Infectious Diseases," is of especial value.

This elaborate paper is illustrated by two plain and ten chromo-lithographs, of which two depict with painful vividness the facial aspect of a patient in the first and last stages of yellow fever, five illustrate the morbid anatomy and histology of yellow fever, and three those of malarial fever, whilst two represent the various matters deposited or collected from the air of rooms in which severe or fatal cases of yellow fever occurred. These latter objects are all drawn from nature by Joseph Jones, M.D., and the numerous figures give evidence of an immense amount of painstaking effort to secure if possible some clue to the real *materies morbi* of yellow fever. It is a pity so much faithful and laborious work should have been wasted, first, for want of higher powers of the microscope, a Beck's one-fifth being chiefly used; second, through omission of systematic culture experiments, which could alone determine the nature of "the minute particles of vibrating matter" figured and described; and third, through ignorance of elaborate methods for staining low vegetable organisms which, as since improved by Dr. Koch, have enabled him to obtain such brilliant and probably trustworthy results. By the employment of some such superior appliances and modes of investigation as those we have alluded to, the great question as to the existence, mode of development, etc., of a yellow fever microbe, may soon perhaps be solved, and should another opportunity for similar extended observations unfortunately occur within the next few years, we shall look for very valuable contributions from Prof. Jones upon this important subject.

5. A large part of the valuable *Maryland* Report is occupied with a record of the proceedings and papers of the well-planned Sanitary Convention held in Baltimore, under the auspices of the Board of Health, November 27 and 28, 1883. At the meetings of this association, which were presided over by Prof. Richard McSherry, were presented a great number of interesting essays, of which our limited space only permits us to refer to the following: Dr. W. S. FORWOOD, in his paper on *Canning Houses and their Relation to the Public Health*, reports the results of numerous inquiries, and concludes that we cannot feel warranted in attributing any special diseases to canning houses, but all the correspondents unite in condemning the nuisance arising from the decomposition of the offal about canneries, which nuisances should be promptly abated by legislative interference.

Dr. A. N. BELL, of Brooklyn, N. Y., delivered an able address on the question, "What shall be done with the sewage?" in which he discussed this problem so important to the well-being of our race, and urged that the cardinal doctrine of all systems should be ultimate removal before putrefaction sets in.

Hon. ELI J. HENKLE, in an essay on *The Late Smallpox Epidemic*, quotes the eloquent assertion of Prof. Chaillé, of New Orleans, when speaking of an outbreak there: "Give any man of sense requisite power for one month, and at the end there need not be a yellow flag to affright the timid, nor a smallpox hospital to pay tribute to." Mr. Henkle declares that the Baltimore epidemic cost the lives of 163 people and \$100,000 in money, a sum which would have paid a vaccine physician in each ward \$500 a year for ten years.

Any of our readers, especially concerned with the disposal of sewage, may find much to interest them in the paper of Col. GEO. E. WARING on the *Liernur System of Sewerage for Baltimore*, and the reply to the same by Dr. C. W. Chancellor, the diligent Secretary of the State Board of Health. In this discussion Col. Waring, taking exception to the statements of Dr. Chancellor in a former essay, asserts that Dr. Chancellor recommends a system which is still on trial, but upon a small scale, and which it would be absurd to resort to with a city having such excellent slopes as Baltimore; also that the agricultural value of the product would be much less than was anticipated. Dr. Chancellor's temperate and courteous reply, in which he relies largely upon facts and figures which he himself collected in Europe last summer, will probably attract even more attention to the plan of Captain Liernur, and especially to the more extended test of its capabilities which appears to be contemplated in Germany. The report on vital statistics and sundry rules for the prevention of various contagious diseases concludes the volume, which is highly creditable to the industry and efficiency of the Board.

6. From the *Iowa* report it is highly gratifying to learn that, during three years of the Board of Health's existence, it has accomplished some of the objects for which it was created, as is proved by the hearty endorsement it has received from all portions of the State. Its principal work has been to educate the people as to the importance of better sanitary and hygienic conditions; to teach them how to escape sickness and death; to impress upon them the clearly ascertained fact that many diseases are preventable, and to disseminate a knowledge of the means for avoiding such maladies. At the same time it is justly urged that practical experience has demonstrated the necessity for greater executive powers and authority being vested in the health board.

A large portion of the book is made up of the secretary's report of the proceedings of the board at its various meetings, and of the voluminous correspondence which he has carried on so industriously in regard to a number of interesting sanitary questions.

The original papers presented are a contribution on *Ventilation* by JUSTIN W. HULL, M.D., Chairman of the Standing Committee on Ventilation and Heating, which ably discusses the important subject of pure air, and is profusely illustrated by woodcuts, adding largely to its value as a means of popular instruction. The essay concludes with a very judicious caution against hoping to combine in such a climate as that of Iowa thorough ventilation, good heating, and cheapness.

The next article is an anonymous, but valuable report on *Hospitals for Contagious Diseases and their Proper Location*, which gives facts, figures, and diagrams tending to show that an almost constant ratio is observed between the amount of hospital operations and the degree of excess of smallpox in the neighbourhood. As a remedy for the local unpopularity which such a condition of affairs would be apt to excite, if known, the author urges the employment of hermetically closed wards heated by a Galton fireplace, arranged as he has described in such a way as to disinfect all the air which escapes from them. What would be the fate of sufferers from variola under "the burning suns of fierce July" in Iowa we can easily conjecture.

According to the essay on the *Geology and Topography of Iowa in a Sanitary Point of View*, by P. J. FARNSWORTH, M.D., the temperature ranges from 95° in summer to -36° in winter, and the rainfall is very

variable. The water is "hard," and the proximity of the ground water to the surface of the earth renders the habitations damp, may predispose to phthisis, and aggravate other complaints. The facilities for drainage are, however, generally good, and, if properly utilized, the medium climate enjoyed in consequence of the central position of the State would be favourable to health and longevity.

J. G. R.

ART. XXXI.—*Surgical Applied Anatomy*. By FREDERICK TREVES, F.R.C.S., etc. Illustrated. 16mo. pp. xii., 531. Philadelphia: Henry C. Lea's Son & Co.

THIS little book, that is, little in bulk, is one of a set being published simultaneously here and in England primarily intended for the use of medical students. But the bulk of these books is altogether deceptive; for the large number of their pages and the style of printing adopted make the amount of matter contained in them very considerable. So there is opportunity afforded for a very good treatise on each particular subject. In the case before us this opportunity has not been missed. We have here an excellent work on the subject of anatomy, as applied to surgery. It is clear, succinct, and as complete as could be asked. It would be easy to give illustrations of its admirable points, but we will only allude to them. It is more likely to be serviceable to the reader and to the author that we should mention points in which we would differ from the latter in matters of opinion. One such point concerns the mechanical principles involved in the structure and contents of the cranium. When, for example, the author speaks of the brain as resting, not on bone, but on a water-bed, we think he mistakes the possibilities of so small an amount of fluid in so rigid a cavity, and overlooks the fact of the incompressibility of water, and the dependence of the water-bed for its peculiar qualities upon the pliable nature of its walls. Again, in regard to the biceps tendon, that is, the "long head of the biceps," we cannot see by what mechanical law the author can defend the repetition of the customary assertion that it keeps the head of the humerus against the glenoid cavity, and prevents the head of the bone from being drawn up toward the acromion. If the tendon and the muscle were extended between two fixed points, this action would be possible; but it has only one fixed point under ordinary circumstances, and only incidentally, and to an extent dependent of the weight at its distal end, can the biceps be supposed to influence the position of the head of the humerus. In most cases the action of the tendon would rather be to twist the head of the bone downward and backward, with a rotary motion. The statement that this tendon strengthens the capsular ligament we think ill founded also. The description of the gland above the inner condyle of the humerus might, we think, well be supplemented with a statement of the significance usually attached to its enlargement, and which has caused it to be known as Sigmund's gland.

We notice a few errors of statement due to slips of the pen, or oversights in proof-reading, such as the expression about the obliquity of the elbow-joint articulation making the application of the hand to the shoulder of the same side possible, followed by the remark that "this

movement is only (!) possible after some excisions of the joint, for in this operation the oblique direction of the articular surface is not reproduced."

But these are minor matters. The book as a whole is worthy of high commendation, and cannot fail to be of great service to any one who may study its pages. And this applies not only to the class for whom it was originally prepared, but to all surgeons and medical men. It is the kind of book that ought to have a wide circulation, and can be safely recommended to the attention of teachers of regional anatomy and operative surgery.

C. W. D.

ART. XXXII.—*Ueber Gelenksresektion bei Caries*. Von Prof. Dr. E. ALBERT, in Wien. *Wiener-Klinik*, IV Heft, April, 1883. Royal 8vo. pp. 16.

Resection of Joints for Caries. By Professor ALBERT, of Vienna.

THIS contribution to the literature of resection comes from one who stands strongly committed to the opinion that resection for caries is not so valuable an operation as many other surgeons consider it. His chief ground for this opinion is the belief that caries and tuberculosis are the same thing, that the operation is dangerous, and that the good results obtained by it are illusory, the disease often recurring after a success has been announced. The present paper opens with a brief and well-written account of the rise and establishment of the operation, in the course of which he says that the French surgeons of the first half of this century did not practise it. "Dupuytren was in love with amputation, and Velpeau had for resection only a Platonic affection." Others, especially in Germany, became its warm advocates, and, with the adoption of the antiseptic method, it was believed that its field would be much extended. But the investigations and operations of König have satisfied the latter, as well as the author, that caries means tuberculosis, and that the operation of resection is far from meriting the enthusiasm which it has evoked. König made one hundred and seventeen resections in the space of three and a half years, and concluded that even antiseptic resection did not materially modify the progress of the general affection, tuberculosis. With regard to the knee, he found that unfortunate results often followed after an interval of six, seven, or eight years. And Albert says that, if these statements and those of Bidder are to be believed—and he evidently thinks they are—then, the resection of carious knees, in children, at least, ought to be abandoned. König's conclusion is not quite so radical. But Albert points to the fact that he manifestly leans toward a method of operating which is hardly to be called a resection. Similar adverse views in regard to the resection of other joints are cited from König, to whom the author says he refers so much because of his large experience and the fact that he is the writer of a text-book. But he cites also—as sympathizing with the views of König—Esmarch, Julliard, Kocher, and Hüter. Between the time of issuing the first and last editions of his book on Diseases of the Joints, Hüter changed from a most ardent and unqualified advocate of resection to a very halting apologist. Professor Albert refers to the struggle in the London International Medical Congress as showing that the change of opinion had been widespread.

After this historical reference, the author turns to the statistics of resection, and makes a very bad showing for the operation. He cites the figures of Leisrink and Jacobsen, which, added together, give four hundred and twenty-six cases of resection for coxalgia, and two hundred and nine deaths—almost exactly one-half. He makes objection to the association of the figures in the case of children with those of adults; since in the former there is a natural tendency to get well. Here he quotes Volkmann as objecting to the operation except as an urgent necessity. He next brings forward the figures of English surgeons, in which the results of non-operative treatment are far better than those of operation. From his own experience, he would say that, in the great majority of cases, caries of the joints of the upper extremity in children heals spontaneously. The results of resection in men, if taken alone, would, he thinks, soon lead to its abandonment. Again, he criticizes the way in which the operation has often been done; the saving of infected soft parts for flaps, the free removal of unaffected bone, and leaving behind the tuberculous capsule. To this picture he points with scorn, and congratulates himself that since 1874 he has consistently abandoned resection for children, and has advocated amputation for adults.

In regard to the present status of the question, Prof. Albert remarks that the operation has been much restricted by the adoption of amputation for adults and of conservative methods for children. Further, he considers the present prevailing method as being a practical abandonment of the old way. Then, it was a cut to the bone and a free removal of this. Now, it is a careful incision and extirpation of the capsule, with only so much of the bone as is really involved. Even with this modification, he does not think resection is a good operation for caries. He speaks of his own operations as confirming this adverse opinion. In regard to the "anti-tuberculous" properties of iodoform, he points out the fallacy of claiming the demonstration of this by the results of operation in which the indispensable thing is held to be the total extirpation of every affected particle. "The most important step which has been taken in regard to this question in late years," he says, "does not concern the technique, but the knowledge, *i. e.*, the re-learning, that all the operations hitherto are to be considered as assaults against a tuberculous focus. Thereby a standpoint is won which was lost for a time. The typical and atypical resections, the capsule extractions, and the *évidements* now group themselves together with the extirpations of tuberculous glands, with the removal of tubercular nodules (for example, in the tongue), with the opening of cold abscesses in the tuberculous, with the slitting of tuberculous fistulæ, etc. It is possible that all these operations are not carried out radically enough; whoever thinks so may, if he will, make the attempt not only to split up an anal fistula, but also to extirpate it and fill up the cavity with iodoform; the attempt would be logically justified." And so he goes on to indicate what he considers the hopelessness of attempting more than to palliate by operative interference in cases of tuberculous involvement.

In concluding, Professor Albert calls attention again to the absence of good statistics as to the result of non-operative treatment of caries of the joints. He also cites, as analogous to the matter under consideration, the history of the "extension method" of treating joint inflammations. This was falsely applied, and false theories as to its *modus operandi* were formulated. Now, it has settled into its proper position. So, he thinks,

will it be with the operation of resection. What is needed are correct statistics of the results of conservative treatment, which might lead to the abandonment of all operative interference in the case of children, and the substitution of hygienic and dietetic methods. "At least," he remarks, in conclusion, "the time for a critical study of the question is certainly come."

We may now, after this brief analysis of Professor Albert's paper, consider its claims in detail. These are of two sorts: one is theoretical, *i. e.*, that caries of the joints and tuberculosis are the same thing; the other is practical, *i. e.*, that the results of resection are so bad as to make its abandonment, or great limitation, desirable.

The first proposition may be said to be entirely unproved. When it is borne in mind that there is a still unsettled dispute among microscopists, and pathologists in general, as to what constitutes tubercle, and what is the real significance to be attached to the so-called tubercle-cell, we may hesitate to accept even the opinion of such able men as König and Albert. It is true that this opinion is backed by certain experimental pathologists; but, from our standpoint, it seems to require a strong prejudice in favour of the theory to see much force in the proofs adduced by its most enthusiastic followers. This subject has been admirably discussed by Barwell, who has gone over the experiments of Schüller, published in 1880, and shown how far they are from being so corroborative of the theory that chronic strumous synovitis is a tuberculous process, as its defenders would have us believe. Without pausing too long over this point, we must quote the following sentence from Barwell's article on disease of the joints in the *International Encyclopædia of Surgery*: ". . . the experiments (of Schüller) appear to show that, even while internal organs are deeply infected with acute and subacute artificial tuberculosis, the synovial membrane, even though severely injured, will resist the infection to such a degree that, as a rule, only doubtful or 'initial' signs of tuberculous action can be detected by either naked-eye or microscopic research." From this it must not be thought that we consider the theory disproved. On the contrary, it may as well turn out that a better understanding of the pathological processes in disease of the joints shall correct what now seems our knowledge in regard to tuberculosis, as that a true conception of the nature of tubercle shall show such views as are held by Professor Albert in regard to caries to be erroneous. As he admits, this is not the time for too positive assertion, but for more careful and enlightened study.

The practical proposition of the paper before us is that the operation of resection is not a good one for general employment. In regard to this, it must be remarked that the statements of Prof. Albert seem to us to be too much those of a partisan, and to have too little of the true judicial spirit. For example, we fail to find in statistics the strong argument against excision which he does. On the contrary, the results, taking those of the hip and knee as of most importance, seem to indicate that excision, giving about the same rate of mortality, is much preferable because of the comparative freedom from mutilation which it permits. This is no trifling matter, and might, in our opinion, be set off against even a higher death-rate. The fact is that excisions of the hip show a mortality of from 30 to 45 per cent.; and those of the knee show one of about 30 per cent. On the other hand, amputation at the hip-joint, for joint disease, is less fatal. Professor Ashhurst gives a table of thirty-four cases, thirty-three of which are available for comparison, and of these only nine died, or less

than 28 per cent. ; while amputation of the thigh, for knee-joint disease, appears to be more fatal than excision. But in regard to this statistics are very conflicting, and it is probable, as Mr. Erichsen says, that there is no material difference in the mortality of the two operations. In regard to all these comparisons, it should never be forgotten that there is an important element which cannot be set down in tables. This is the personal equation. Some surgeons might have good results in amputations, while in resections they would have very bad ones. Some might refer to one or the other method of treatment cases which another would decide about in an opposite way. This is as true, and as influential in results, as the well-known fact that some surgeons fare better without what are called antiseptic precautions than others do with them. Until elements of this sort can be eliminated or properly estimated, it is vain to attempt to decide the merits of an operative method by its statistical results alone. The opinion of an experienced and conscientious surgeon is of more value than many tables. Taking such opinions as our guide, we have come to this conclusion, that in the case of the hip-joint, excision is decidedly preferable to amputation, and in the case of the knee-joint, it is still to be preferred if the condition and circumstances of the patient permit the hope that the long time required for the after-treatment will not prevent a good recovery. In other words, an operation which causes less mutilation is always to be chosen, *cæteris paribus*, before one which sacrifices part or the whole of a lower limb.

In conclusion, it may be remarked that, while entertaining the conviction that it is premature to consider chronic synovitis with caries of a joint as a form of tuberculosis, and a mistake to reject the operation of resection as inefficient and dangerous, we do not regard a paper like that before us as wasted, even though it fails to convince others of the truth of its writer's convictions. It contributes to a just solution of a problem which is of great importance to mankind, and it is filled with the spirit of true conservatism. The good of the patient, and not the glory of the surgeon, is clearly the object of the author. To this we may add that its style is attractive above that of most controversial papers. C. W. D.

ART. XXXIII.—*The Pathology, Diagnosis, and Treatment of the Diseases of Women.* By T. GRAILY HEWITT, M.D. Lond., F.R.C.P., Professor of Midwifery and Diseases of Women, University College, etc. A new American edition from the fourth revised and enlarged London edition. With 236 illustrations. Edited, with Notes and Additions, by HARRY MARION SIMS, M.D., Attending Surgeon to St. Elizabeth's Hospital, etc. New York: Bermingham & Company, 1883.

THE profession is to be congratulated upon at last having a new edition of Dr. Hewitt's well-known work. During the ten years past there have been some reprints of the third edition, but those who bought them expecting to find therein the latest words upon gynæcological science and art were disappointed.

The first edition of "Hewitt" appeared some twenty years ago, and it was a most unsatisfactory book for the practitioner, since it was almost entirely a work upon diagnosis; but this objectionable feature has been

gradually lessened in successive editions until in the present one we have presented an admirable treatise upon diseases of women, one which will prove most acceptable and useful.

Dr. Hewitt is the especial representative of the mechanical system of uterine pathology, and therefore a large space in the work is given to the pathology and treatment of uterine displacements; most gynecologists hold that he exaggerates the importance and the frequency of these disorders. In considering their treatment, we are glad to find him stating that he regards "the Albert Smith type of the Hodge pessary as the best."

Of course, our space not permitting, nor the fourth edition of a book requiring an extended notice, remarks will be confined to a few points, and these chiefly needing, as we believe, criticism.

Both in the immediate and remote operation for rupture of the perineum, Dr. Hewitt directs that the patient's knees should be tied together, a practice which is utterly unnecessary, and which causes great discomfort to the unfortunate sufferer. Again, in the after-treatment of ovariectomy, Dr. Hewitt says, that for some days the patient must lie absolutely upon the back. This is even worse and more needless than tying the knees together after a perineorrhaphy or a perineoplasty. Does not the author strain a point when he makes rupture of the perineum a cause of anteversion and of antelexion of the uterus? Further, is it quite fair to quote Copeman's successful cases of dilatation of the cervical canal for the vomiting of pregnancy, and not mention that this method in other hands has failed quite as often as it has succeeded? It is stated that Dr. Blundell extirpated the cancerous uterus three times in 1828; but if Dr. Hewitt will turn to the *Lancet*, November 22, 1828, he will find over Dr. Blundell's name the statement that he had performed the operation four times.

Dr. Hewitt holds that in some of the cases in which Battey's operation had been performed, the uterus was at fault rather than the ovaries, so that in a large proportion of these uterine cases the operation will prove not to be necessary when more attention and time can be given to the cure of the uterine disorder. These are wise words, and should be given due weight, for as cannon are said to be the *ultima ratio regum*, so this operation should be limited, as Battey has urged, "to otherwise incurable maladies," and we might add such as seriously affect health and usefulness, or imperil life.

Dr. Sims has made the book very much more valuable by his notes, especially by those giving the practice and opinions of his illustrious father, whose recent death has awakened such universal sorrow in the profession.

We cannot commend the proof-reading which permits the twice-made statement, and that on the same page, that the stitches after a vesico-vaginal fistula operation are to be removed on the eighth day, which allows reflexed for retroflexed, and which has not corrected the following sentence: "As regards the material for sutures, silk or catgut are preferred by some operators to silver wire;" similar lapses are found elsewhere in the volume.

Nor can we commend the printer's work: poor type, or bad ink, gives the page a dull, blurred look.

Finally, we must condemn many of the illustrations as most carelessly made by the engraver; this remark applies especially to those introduced by the American editor, most of which are far from good. Look at page 454, of the second volume, for the work is in two volumes, at a picture taken from "Savage on the Anatomy of the Female Pelvic Organs," and see what dreadful work has been made in the supposed copy. It is in-

tended to represent an operation for vesico-vaginal fistula. In "Savage" the parties are white, nurse, doctor, and patient; but in "Hewitt" they are black; the operator is plainly an Ethiopian, with a great mass of kinky black hair, and the nurse who holds the speculum has pulled so resolutely upon it that she has bent the vaginal blade straight, and has it carefully placed upon the perineum, while she rests her cheek quite confidently upon the hair, or wool, cushion furnished by the operator's head. One or two patches of white upon her forehead and face in the midst of dense blackness show that she is probably suffering from leprosy, a disease which also manifests itself in larger patches upon the visible, but unmentionable portions of the unhappy, headless female undergoing the operation, and who has one foot gracelessly resting upon the operator's knee. Vastly better no illustration at all than such as this. Several other illustrations only lack in equal badness from their failure in equal bigness. T. P.

ART. XXXIV.—*On Malpositions of the Kidneys* By DAVID NEWMAN, M.B., C.M. Thesis for the Degree of M.D., University of Glasgow. 8vo. pp. 63. Reprinted from *The Glasgow Medical Journal* for August, 1883.

UNDER this caption Dr. Newman presents, in an interesting little brochure, a summary of our present state of knowledge with regard to a not uncommon class of diseases. The subject is carefully treated in every aspect, the etiology, pathological anatomy, physical signs and symptoms, diagnosis, and general and operative treatment being fully considered in a terse, but, at the same time, a clear and intelligent manner.

Dr. Newman divides misplacements of the kidneys into three classes: (1) simple misplacements without mobility of the organ; (2) "movable kidney," where the kidney is perceptibly mobile behind the peritoneum; and (3) "floating kidney," where the peritoneum forms a meso-nephron which attaches the kidney loosely to the spine. With regard to simple misplacement without mobility the author states that "malposition, within certain limits, is a pretty frequent occurrence, and may exist without causing any disturbance. In 300 *post-mortem* examinations, eight cases occurred where the position of one or both kidneys might be described as abnormal. In three of these cases there was also malposition of the supra-renal capsule. Malposition of the kidney does not therefore necessarily involve an alteration in the position of the supra-renal capsule;" an interesting conclusion, since a casual student might suppose that, on account of the intimate anatomical relationship which exists between the kidney and the supra-renal capsule, any anomalous position of the kidney would disturb the corresponding supra-renal body. Dr. Newman's experience also leads him to conclude that, as a general rule, these malpositions "are associated, particularly when the displacement is congenital, with some deviation from the normal in regard to the position of the large intestine and peritoneum, and not uncommonly the course and length of the ureter are found to be abnormal." An interesting case is quoted from Dr. Butler's report, in which "the kidneys were united, or fused into one with a central line or raphé making a longitudinal fissure over the surface of the organ, better marked on the posterior than on the anterior aspect." The

length of this duplex organ was five inches, and the breadth three and three-quarter inches. The ureters sprang from a pelvis in the centre of the anterior surface of these organs, but were normal in the points of attachment to the bladder. The circulation was of course abnormal. Yet these cases often escape observation during life, since they give rise to no serious symptoms; sometimes the misplaced kidney has been mistaken for an abdominal tumour, but, as a general rule, the discovery is postponed until a *post-mortem* examination reveals it.

As may be seen by his classification, previously alluded to, Dr. Newman does not accept the terms "movable kidney" and "floating kidney" as synonymous, following in this Sir William Jenner's differentiation. He gives considerable space to a discussion of this point, finally stating that a floating kidney and a movable kidney are to be diagnosed by the degree of mobility only. The necessity of a differential diagnosis "is all the greater when operative interference is contemplated. In the case of movable kidney the organ can be got at from behind without opening the cavity of the peritoneum, whereas in floating kidney (when there is a meso-nephron), the kidney lies within the cavity, and cannot be reached without entering the peritoneum," a fact which is not such a bugbear to our recent operators as it was to those of a decade ago.

Dr. Newman finds the proportion of cases of movable kidney in his own experience to be about one in the male to seven in the female, "and about 46 per cent. of the cases were observed between the thirtieth and fortieth years, and 20 per cent. from forty to fifty years of age, and in all, 81 per cent. between the ages of twenty to fifty." All this seems to point towards pregnancy as a common cause of the disease. Indeed, the author is borne out by Dr. Sawyer, who says (*Birmingham Med. Rev.*, vol. i.): "Many, perhaps by far the larger number, of the subjects of floating kidney are women who have borne children. All the examples which have fallen under my notice have been observed at some period after child-bearing." Cruveilhier, quoted by Dr. Roberts, attributes to tight lacing many cases of movable kidney, though Laudan attaches no importance to the theory that the stays may be a cause of this disease.

Dr. Newman prints Laudan's table, "showing, in forty-five cases, the relative frequency of the different complications of movable kidney," by which it can be seen that 25 per cent. of the patients had pendulous abdomen, 13 per cent. suffered from descent of the uterus, or vagina, 13 per cent. from cancer, 15 per cent. from retroflexion of the uterus, and 7 per cent. from hernia.

With regard to diagnosis of movable kidney, Dr. Newman considers it comparatively easy. It may, however, be mistaken for "enlargement of the liver, an abscess, a malignant tumour, enlargement of the gall-bladder, ovarian tumours, or even a collection of feces in the colon."

The treatment resolves itself naturally into two classes: general and operative. In many cases no more is needed than a broad abdominal elastic bandage, a method of treatment upon which Dr. Newman lays much stress. Various trusses are described, preference being given, however, to the bandage alluded to, which, from its simplicity and facility of adjustment, certainly recommends itself.

The operations of *nephrectomy* and *nephrorrhaphy* are fully considered. Dr. Harris's table of nephrectomies (published in the *American Journal of the Medical Sciences* for July, 1882) is printed in full, although it

is complete only up to the 15th of March, 1882. But Dr. Newman adds a list of nephrorrhaphies, eight in number, which, as far as I am able to ascertain, is complete up to the present time. The results in the latter operation are certainly very satisfactory, no deaths having occurred, and in all the cases the movements of the kidney having been prevented, and the symptoms from which the patients suffered previous to the operation having disappeared.

Dr. Newman sums up the advantages of nephrorrhaphy over extirpation of the kidney as follows:—

“(1) In the operation of nephrorrhaphy the organ is not removed, so the secreting tissue is not diminished in amount as it is in excision, and there is therefore no danger of removing, as has been done, the only kidney the patient may be possessed of. (2) The mortality in excision, even in cases where the remaining kidney was healthy, is not even encouraging (23 per cent.), whereas, in eight cases operated on by nephrorrhaphy, there have been no deaths. (3) Nephrorrhaphy may be performed where both kidneys are movable, or where one of them is diseased. In one of Hahn's cases the kidney, which was not displaced, contained a calculus. This did not prevent the operation being successful. (4) In stitching the kidney to the abdominal wall the perineum is not opened, as it is in the anterior operation for excision, where the membrane is incised at least twice. (5) Extirpation is only permissible when nephrorrhaphy has failed, and the patient's life is still seriously threatened, or when the movable kidney is diseased and the fixed kidney healthy.”

With regard to cases of true floating kidney, Dr. Newman says but little, the rarity of the disease and the fact that it is always a congenital condition being the chief points dwelt upon. One case is quoted (reported by Mr. Durham) in which this condition is associated with other malpositions of the peritoneum and abdominal organs. The only point of importance to be noted is that the peritoneum must be opened in operating upon a floating kidney; the condition, therefore, is not so favourable for nephrorrhaphy as that of movable kidney. “It is not possible, however, previous to the operation, to distinguish, by physical examination, the two conditions” is an axiom laid down by the author, but disputed by some authorities.

In an appendix Dr. Newman gives a detailed account of four cases, one in which he successfully performed nephrorrhaphy; two others, in which the elastic bandage was used with good effect, and a fourth which was still under observation in which the diagnosis that the movable kidney alone was diseased was made by means of catheterization of the ureters, an operation which is fully described.

The pamphlet, small as it is, contains a *résumé* of all that is valuable in our knowledge of the malpositions of the kidney, and is a useful addition to the literature of the subject.

R. P. R.

ART. XXXV.—*Saint Thomas's Hospital Reports*. New series. Edited by Dr. SEYMOUR J. SHARKEY and Mr. FRANCIS MASON. Vol. XII. 8vo. pp. xiii. 351. London: J. & A. Churchill, 1883.

THE *Saint Thomas's Hospital Reports* for 1883 is fully up to the high standard which was maintained in the preceding volumes. The

clinical papers which it contains are full of excellent and suggestive material, this year strongly preponderating on the side of clinical medicine, there being only eight surgical papers of the nineteen contained in the Report.

The volume opens with an interesting contribution from Dr. WILLIAM M. ORD, *On Some Clinical Aspects of Glycosuria*, in which the non-diabetic form of the disorder is discussed, the clinical records being taken from Dr. Ord's own note-book, and the patients to whom he refers all being fifty years of age and upwards.

The paper opens with the details of an interesting case of glycosuria in a patient, aged sixty-seven years, associated with, and probably in some degree dependent upon, excessive mental strain, in which at the outset there was also considerable polyuria, the amount of urine voided amounting to between sixty and eighty ounces *per diem*. Under appropriate treatment both the "quantity of urine and of sugar decreased, but though the quantity of urine then remained but little larger than the average, the sugar diminished less in proportion." Dr. Ord adds that he heard from the patient from time to time; that his urine remained unchanged from the condition just noted; and not until eight years after the first examination did he have an opportunity of further personal investigation. "The patient then began to be seriously ill with symptoms of Bright's disease, and I was called to see him in consultation with his ordinary medical attendant. He was now in the last stage of emaciation and exhaustion, with anasarca, sloughing tonsils, rigid arteries, and albuminuria. The urine, of sp. gr. 1037, was acid, gave a strong sugar reaction, and contained, besides albumen, an abundance of long straight rigid casts. There was also a copious deposit of uric acid in agglomerations of flat, beautifully crystalline plates. He died three weeks later. The urine passed the day before death was of specific gravity 1035, and gave a full sugar reaction." The interesting circumstance is also added that both the widow and eldest son of this patient also suffer from glycosuria.

Dr. Ord uses this case as a text with which to open his report upon the cases of non-diabetic glycosuria contained in his note-book. They number twenty-two, of which but two occurred in the female; the ages, as has been said, ranged between fifty and eighty-four, and none of them was accompanied with any marked diuresis. "It is impossible in any one of them to see glycosuria assuming the individual importance which it claims in typical diabetes mellitus. On the contrary, it is reduced to the rank of a symptom of other troubles." In Dr. Ord's cases four conditions of importance have this form of glycosuria associated with them: "(1) Preponderantly, conditions of nerve disease or disorder appearing either as probable causes or as associated troubles. (2) Gout. (3) Errors of diet, consisting in over-eating and over-drinking. (4) Albuminuria." With regard to cases of the first class, associated with glycosuria there were seven who "told a story of excessive and prolonged mental work or anxiety preceding the recognition of glycosuria:" in one, "after much emotional excitement, insanity was at last fully declared;" in one, "after a long course of strenuous mental labour, scarcely intermitted through the nights of many years, hemiplegia occurred, and apoplexy ended the chapter;" in one apoplexy occurred suddenly; in two distinct locomotor ataxy existed, and in a third the ataxy was present with signs of affection of the whole breadth of the cord; in two cases decided hypochondriasis was noted; and angina pectoris occurred in three cases. (2) Gout

existed in eight; rheumatoid arthritis (of twelve years' duration) in one. (3) In eight cases "there was an acknowledgment of over-indulgence in the pleasures of the table, and of these seven admitted marked alcoholic excess." (4) Albuminuria existed in ten cases; "in four associated with gout, in one with manifest contracted kidney, in the rest only during a period less than that of the glycosuria, or intermitting." Such is the summary of the cases which Dr. Ord has classed under the four heads. Some of the cases are recited at length, others simply noted, the whole is of considerable interest and importance. Dr. Ord goes at some length into the consideration of the "physiological causes" of glycosuria, and ends his paper with some hints as to the treatment. The whole ground is thus covered, and the paper is to be regarded as a very valuable addition to its literature of the subject.

Dr. GULLIVER presents a short report of *Two Cases of Ulcerative Endocarditis following an Attack of Acute Pneumonia*, which is interesting not only inherently, but from the fact that Dr. Ord in the last Report gave the notes of a case of the same nature. Dr. Gulliver's first patient presented the following physical signs upon admission: "Heart: impulse imperceptible; dullness not increased; sounds feeble, unattended by murmur. Pulse 90, weak. Temp. normal. Lungs: dullness with tubular breathing and moist crepitation over upper half of right back; anteriorly crepitation below right clavicle with impaired resonance. Left lung normal. Tolerably copious expectorations. Respiration 28. Appetite fair. Bowels regular. Tongue red, dryish, and cracked. Nothing abnormal detected in abdomen. Urine normal." Diagnosis was made that the patient was convalescent from an attack of acute pneumonia of the right apex. But after five days of unaltered condition, a rigor followed by pyrexia, followed later by profuse perspiration, ushered in a new train of symptoms, and upon a second examination of the heart "a systolic blowing murmur was detected at the apex. On the next day a double murmur, systolic and diastolic, was heard at the base, and it was noted that the systolic murmur at the apex was louder and more prolonged." From this time there was no doubt as to the diagnosis. The *autopsy* showed the following cardiac lesions: "*Heart* somewhat enlarged, weighed fourteen ounces. Right side contained a quantity of recent clot; valves normal. Aortic valves incompetent. Two of the cusps were glued together by a large mass of vegetations adherent to them. It was opaque, yellowish-white in colour, soft and friable, and about the size of a hazel-nut. Its origin was evidently of pretty recent date. Mitral valve also incompetent. There was attached mainly to the outer cusp a large vegetating mass, precisely similar in character to that on the aortic valve, but larger. Entangled in the valve was a quantity of quite recent, pale, translucent fibrin." The right lung gave the usual evidences of the recent pneumonia.

Case II. presented much the same physical signs upon admission as those noted in Case I. On the thirteenth day of his illness he also experienced a rigor with a succeeding rise of temperature, and the next morning another rigor. It was then noted that "there were still dullness over right back, especially at upper part, with moist crepitation and increased vocal fremitus and resonance, also there were signs of bronchitis. A short musical systolic murmur was heard, most intense over fourth left costal cartilage." It was then diagnosed that he was suffering from acute endocarditis affecting the aortic valves. The *autopsy* gave the following

results : "Heart enlarged, weighed seventeen ounces. The enlargement appeared fairly uniform. Valves of the right side normal. Attached to ventricular surface of posterior flaps of aortic valve was a large prominent friable vegetation the size of a marble, causing great obstruction but not regurgitation ; mitral valve normal. The left ventricle contained a large quantity of recent clot."

In his remarks upon these cases Dr. Gulliver concludes that the attack of acute pneumonia cannot be regarded as a mere complication, such as occasionally supervenes in the more advanced cases of heart disease, but that "on the whole it is fair to regard the pneumonia as having the same origin as the endocarditis. Supposing that the latter is dependent on the presence of organisms, as there is evidence to show that it is, may not the pneumonia in such cases as these arise from the same cause?" Whatever be the conclusions, the clinical history of the two cases is interesting and valuable.

Dr. HADDEN contributes a note on *Paraplegic Rigidity in Hemiplegia*, a condition not only interesting theoretically, but of some concern to the patient himself. This state is one in which a lesion in one cerebral hemisphere gives rise to "direct as well as to crossed paralysis. The former is usually slight and transitory, whereas the latter is well marked and not unfrequently persistent." Dr. Hadden relates five cases, and formulates the following law concerning this class of paralysis. "In bilaterally associated nerve-nuclei, irritation on one side, as in the case of inhibition, reacts on the opposite side."

Dr. STONE contributes a very interesting paper upon *Some Effects of Brain Disturbance on the Handwriting*, in which he relates the details of three cases of brain trouble, one occurring in his own person. In introducing the reports of these cases, he says: "It is not surprising that affections of the cerebral hemispheres competent to interfere with the complex coördination of speech should also show their influence on the very similar act of writing. Essentially both the functions are acquirements . . . which have by long practice become automatic ; so that although the mechanism intermediate between the idea, and its expression to the ear or to the eye, comprises several stages all originally voluntary and distinct, we have entirely lost consciousness of the various efforts of will which in each stage we instinctively put forth. The same process obviously takes place when we read." In all three of the cases of which Dr. Stone writes there was agraphia : in the first following right hemiplegia and associated with aphasia ; in the second (Dr. Stone himself) following cerebritis and associated with a curious reduplication of ideas both in speaking and writing, a mental stammering so to speak ; and in the third case following cerebral embolism, the attack being ushered in by a severe epileptiform convulsion. In all the cases the agraphia was very marked ; in the first recovery was very gradual ; in the other two remarkably rapid. Very excellent fac-similes of the various handwritings are given, which with the letter-press make the article very complete and valuable.

Dr. SEMON presents a detailed report of the cases treated in the *Throat Department of the Hospital in 1882*, with an excellent summary at the conclusion. Among the interesting cases treated were four of that very rare affection Herpes of the Pharynx, of which all yielded to sulphate of quinine and a chlorate of potash gargle ; a case of gangrenous tonsillitis which was treated by strong cauterization with solid nitrate of silver, and the internal administration of iron and quinine, and which recovered without

further mortification; a case of carcinoma of the left tonsil spreading downwards to the larynx, in which gastrotomy and finally tracheotomy were performed, and which had a fatal termination; two cases of malignant neoplasms simulating benign papillomata in the incipient stages, which were still under treatment at the time the report was made; two cases of endo-laryngeal and one of epiglottidean carcinoma, the former still under treatment, tracheotomy having been successfully performed in one, the latter also having sustained the same operation, but having a fatal termination; a case of sarcoma of the larynx, in which tracheotomy was performed, and which also terminated fatally. The post-mortem examination in this case is given as follows:—

“Larynx and lungs removed *en masse*. The inter-arytenoid fold and posterior wall of larynx are swollen and ulcerated. The glottis is much narrowed, not admitting the tip of a finger. The left vocal cord is ulcerated, the surface being white and soft. The right vocal cord is also ulcerated, though more slightly. The trachea was found to be displaced backwards and to the right by a mass of new growth, situated in front of it, apparently in the position of the glands, and reaching down to its bifurcation. The mass was almost concealed by the anterior edges of the lungs. It lay more to the left than to the right of the middle line. On section it was found to be very soft, white, and blood-stained in parts. Microscopically small round cells were seen. The growth would appear to be a sarcoma.” The lungs, liver, kidneys, and bronchial glands were also found to be invaded by the disease.

Dr. Semon also discusses the utility of local applications of iodoform in laryngeal phthisis. In 15 cases treated by him in his department he found the use of these applications to be followed with fairly good results, and especially in two cases the history of which he details. In these there was no doubt either as to the diagnosis or the cure. He summarizes his experience by saying that

“regular applications of iodoform in powder to the ulcerations of laryngeal phthisis produce cleansing, and in many cases diminution in size of the ulcers, often diminution of the surrounding œdematous infiltration, decrease of pain and soreness, and frequently considerable improvement of the dysphagia and odynphagia which had previously formed some of the most distressing and most serious features of the disease.”

One other interesting case of *erysipelas of the larynx, complicated by pleurisy, and followed by pyæmia, with a fatal termination*, also reported by Dr. Semon, deserves passing mention. The diagnostic signs of the erysipelas are interesting:—

“Although no swelling was visible underneath the clavicles, an erysipelatous redness extended down on both sides to about mid-sternum, and the chest walls within the limits of the redness were slightly œdematous on pressure. Internally acute follicular tonsillitis, more especially on the left side, was seen. The larynx was seen to be pushed towards the right side. The left half of the epiglottis and the left arytenoid cartilage were enormously swollen, œdematous, and of a dusky red colour. The epiglottis was considerably twisted; the right half of the larynx much congested. The voice was almost extinct, and there was considerable dyspnœa. Temp. 103.4°.”

The pleurisy was first noted on the seventh day, and the pyæmic symptoms followed closely upon the eighth; death occurred on the eleventh day. The autopsy confirmed the diagnosis, abscesses being found in the neck, and evidences of double pleurisy and peritonitis being plainly present.

Dr. BRISTOWE presents some *Clinical Remarks on So-called "Painful" Paraplegia*, illustrated by notes of five cases, and the partial account of a sixth. In all those cases the "painful" paraplegia was dependent upon malignant growths present in some part of the body, and involving, or exerting more or less pressure upon, the main nerve-trunks. In the first case the pain from which the patient suffered about the hips, thighs, and legs, associated with loss of power over the lower limbs, and with wasting and flaccidity of muscles and absence of tendon-reflexes, led to the diagnosis of "paraplegia due to malignant disease involving the lumbar vertebræ." The occurrence of symptoms suggestive of malignant disease in the respiratory organs sustained this view of the case, and a post mortem confirmed the diagnosis, a nodulated tumour being found moulded to the bodies of the second and third lumbar vertebræ. Case II. was one of secondary sarcoma of the lumbar vertebræ, causing paraplegia, and of left thigh-bone permitting of spontaneous fracture, following amputation of left arm for sarcoma of humerus. "Case III., sarcoma of periosteum of os innominatum, with secondary growths in liver, kidneys, lungs, and elsewhere; paraplegia; death." This case, as Dr. Bristowe remarks, "stands midway between the two cases that precede it and the two that follow; for while, as in the former, there was paralysis of both legs and a growth spreading over the surface of the vertebræ, and so implicating the lumbar plexus, there was also, as in the latter, a tumour springing from the periosteum of one ileum, which was probably the primary and most important lesion, as it was certainly the most prominent feature of the case during life." The titles of the two cases sufficiently indicate this: Case IV., sarcomatous tumour of periosteum of ilium and ischium, with paralysis and wasting of leg; secondary growths in lungs. Case V., growth, probably sarcomatous, of venter of right ilium. The details of these cases are of great interest, but should be read as a whole; the abstracts which have been given show the intention of the paper; in the first two cases the diagnosis was as difficult as it was easy in the last three.

Dr. HARLEY's paper, *On the Treatment of Hydatid Tumours of the Liver*, includes the report of one case in which a radical cure was effected by operative procedure, according to a method which he recommends as perfectly safe and satisfactory. It consists, briefly, in the use of the trocar and canula, free drainage, and the injection of carbolic acid in weak solution (1 in 60), as an aid in clearing away the cyst-membrane, a course similar to that adopted for the radical cure of hydrocele. A detailed account of all the steps of the operation is given, and though of importance is too long for quotation. The tumour in the case reported was of eight years' duration, and healing was accomplished by the seventieth day; the only complication was the development on the fourteenth day of a slight pneumonia, which subsided in about a week. The patient was kept under observation after leaving the hospital, and two years later was in excellent health.

Dr. PAYNE's contribution, *On Two Cases of Pemphigus*, contains detailed reports of two cases, one of a child three and a half years old, the other of a man seventy years of age. Excellent illustrations are added of the condition of the nails of both fingers and toes in the first case, which was extremely obstinate, and in which the most marked improvement followed the exhibition of phosphorus (oleum phosphorei) after almost every other alterative had been tried with only varying success in each case. The second case improved most satisfactorily on the adminis-

tration of arsenic. Dr. Payne appends a chart of the range of temperature in this last case, with the remark that he does not know of any fully published account of the ranges of temperature in this disease.

Dr. STONE contributes a paper *On the Electrical Resistance of the Human Body*, which is of some interest, and in which one case is quoted as showing the increase of electrical resistance by reason of high temperature. The subject is an interesting one, and the paper very readable.

The usual statistical reports of the various departments for 1882 are added. In the obstetrical report we note that in five cases of severe hemorrhage hot-water injections were used with success in four, the fifth case defying both ergot and hot water; a mixture of one part of liq. ferri perchlor. fort. to five parts of water was injected into the uterine cavity with immediate benefit.

An excellent general index of the twelve volumes of the *new series* has been prepared by Mr. Wagstaffe, and is inserted at the end of the volume.
R. P. R.

The first article which treats of a surgical subject is one by Mr. F. LE GROS CLARK, and is entitled *Some Records of Surgical Experience*, being a contribution to the collective investigation of disease. In this paper the writer records, in a most instructive manner, his personal experience in the treatment of a large number of surgical cases occurring in the course of an extended hospital practice.

With the *antiseptic method of treating wounds* the author has evidently had little personal experience, and is somewhat sceptical as to the revolutionizing influence which it has had on modern surgery, and expresses the following view, which is held by many surgeons of the present day who are not prepared to accept the antiseptic theory in its entirety:—

“But long before this modern treatment of wounds was introduced I had learned that the success of operations depends much on the most scrupulous cleanliness and assiduous attention to what are too often regarded as minor details, and I am free to confess that I attribute much of the success of the antiseptic method of treatment to the unremitting care exercised in these respects.”

The author's experience with *lithotomy* has been confined to the lateral operation of which he has had forty cases with two deaths, and strange to say, the unsuccessful results have been in the cases of children. Among the accidents occurring in lithotomy he mentions troublesome venous hemorrhage in old men, and wounds of the rectum in three cases, none of the latter proving fatal, and one only leaving the patient with a vesico-rectal fistula.

His observations upon the treatment of *hernia*, are, we think, particularly valuable. He considers the operation for the relief of strangulated hernia one of the most successful in surgery, and believes that “rough manipulation, purgatives, and temporizing delay account for a large percentage of the fatal cases of herniotomy,” and thinks it a safe surgical axiom to act upon, “that when in doubt it is right to operate.” The hernias of sudden descent resulting from violence he considers the most dangerous variety, and believes that early operations only can save these cases.

In the treatment of *caries*, Mr. Clark does not adopt the modern practice of free and extensive removal of the diseased bone by gouging, but rather prefers incision and exposure of the diseased tissue, and its treatment by the injection of a dilute solution of acetic acid in water.

Although we do not agree with him as to the inadvisability of operations for the removal of carious bone, we must acknowledge that the latter method of treatment in a modified form, namely, the injection of Villate's solution, has, in cases of obstinate caries in inaccessible regions, been followed by the most gratifying results.

In speaking of *amputation of the extremities* for injury, and what should influence the surgeon's judgment in this matter, he very justly remarks "that precedents are valuable under the circumstances, but that they may be misleading, for the local condition is not always the most important consideration."

In *fissure of the anus*, the author decidedly prefers the treatment by incision to that of dilatation or the use of caustics.

In considering the *ligation of arteries*, Mr. Clark mentions a case of ligation of the subclavian artery for axillary aneurism in which a fatal result occurred by reason of the patient's tearing away the ligature, and points out that this would have been impossible had an animal ligature been used the ends of which would have been cut short.

In hemorrhage from the palmar arch, when a compress does not control the bleeding he recommends ligation of the brachial artery; this, we think, might be necessary in case of secondary hemorrhage from wounds of the palmar arch, but for the arrest of primary hemorrhage we would first make an attempt to ligature both ends of the divided vessel or vessels in the wound, even at the expense of enlarging the latter considerably.

In *ruptured bladder* the author recommends abdominal section, and closing the vesical wound with animal sutures, and thorough sponging out of the cavity, believing that the fatality in these cases is due to the perpetuation of the mischief rather than to the immediate effects of the lesion.

The subject of *amputations* receives a full share of attention, and the author expresses a decided preference for the primary operation in suitable cases, but would relegate all doubtful cases to the late secondary period, mentioning the well-recognized higher rate of recovery after the tardy secondary amputations. The method of amputation upon which he looks with most favour is that by skin flaps, either circular or semilunar; and in amputation at the ankle-joint he prefers Syme's to Pirogoff's operation.

Fractures of the skull are next discussed, the author favouring the use of the trephine in appropriate cases, but considers the removal of fragments impacted in the brain of paramount importance, and thinks the overlooking of any such fragments much more mischievous than any amount of cautious search; he also believes fracture of the base of the skull a recoverable injury, in which expression of opinion we most heartily concur.

Operations in general and their management, and exploratory operations are next considered, and the rule of free removal of the skin with malignant growths is strongly advocated.

Excision of joints is discussed at some length, and great stress is laid upon the free removal of all diseased tissue. In excision of the knee-joint the author recommends a wedge-shaped incision of the tibia to which the femur is to be adapted to give some fixation to the parts; this, he states, is readily accomplished, as the tibia is generally more extensively diseased than the femur. In regard to the latter point our experience is opposed to that of the author.

Imperforate and artificial anus are briefly considered, and also *dissecting wounds*, in speaking of which he mentions an apparent individual

susceptibility to wounds of this nature, and cites his own case in which this peculiarity seemed to exist in a marked degree. This paper is to be continued in a succeeding number of the reports, and we can only express the hope that the next portion will contain as much that is interesting and practical as the present article.

Mr. JOHN CROFT contributes an interesting paper upon the *Treatment of Cancerous Obstruction of the Œsophagus by Permanent Catheterism*, illustrated by two cases. The author adopted the treatment recommended by Dr. Krishaber, of Paris, who reported four cases before the International Congress in 1881, in which this procedure was made use of for the relief of severe stricture of the Œsophagus. Krishaber's reasons for his preference of permanent catheterism to gastrostomy are briefly and clearly laid down. Mr. Croft's first case was one of obstruction of the Œsophagus from epithelial cancer. Treatment was here commenced by the introduction of a gum-elastic tube of the calibre No. 5 catheter (English gauge), which was gradually increased in size until a No. 16 tube had been introduced; this was finally replaced by a No. 12, and finally by a No. 8 tube, as this produced less irritation, and was found large enough for all purposes of feeding. This case did well for more than two months, when the increase of the growth caused respiratory obstruction, probably from pressure on the recurrent laryngeal nerve, which necessitated the performance of tracheotomy; the patient did well after the operation, but died seventy-three days afterwards from dyspnoea, consequent upon displacement of the tracheal tube by the increasing growth, having worn the Œsophageal tube for one hundred and forty-nine days.

The second case was also in an adult who was suffering from stricture of the Œsophagus from malignant growth; in this case a No. 6 tube was passed, and the patient lived for nearly four months, but finally died by reason of the extension of the disease.

Some very useful information regarding the construction, passing, and changing of the tubes, and the form of nourishment which should be allowed, is also given.

The results in Mr. Croft's cases were certainly very satisfactory, and we can but agree with him that permanent catheterism offers a useful improvement in the surgical treatment of this very distressing class of cases.

Mr. BERNARD PITTS records a remarkable *Case of Hemorrhage from the Internal Carotid Artery subsequent to Suppurative Tonsillitis*. The patient, after the spontaneous opening of the suppurative tonsil, had several profuse hemorrhages, which rendered it advisable to ligature the left common carotid artery. This was accordingly done, but was followed by recurrence of the hemorrhage, and death in thirty hours. A post-mortem examination revealed an abscess cavity with an opening in the posterior surface of the left tonsil, exposing the internal carotid artery, in which an ulcerated opening was found opposite the tonsil, nearly as large as the nail of one's little finger.

Some interesting observations are made upon the source of the hemorrhage from the internal carotid artery after the ligation of the common trunk. It was found that, in the event of an opening in the internal carotid artery and ligature of the common trunk, the blood would find its way through the external carotid of the same side much more speedily and in larger quantity than we would believe possible. It is, therefore, recommended that both the external and common carotid arteries be liga-

tured in cases of this nature. It is pointed out as fortunate that no operation was performed on the tonsil in this case, as the hemorrhage might have been attributed to that cause. This case has also a very important medico-legal bearing.

Mr. G. MAKINS records two cases of *Spontaneous Symmetrical Gangrene of the Toes* in children aged respectively 14 and 7 years. The author, after eliminating the ordinary causes of this lesion, is disposed to class these cases as examples of that peculiar form of gangrene which has been described by Raynaud,

"who defines it as a variety of dry gangrene, characterized by the double fact that it is independent of any organic change in the vascular system, and always affects similar parts; he considers that its occurrence may be explained on the theory of a persistent vascular spasm commencing in the capillaries and extending to the larger vessels, where it may exist to a greater or less degree. The origin of these vascular phenomena he attributes to changes in the vaso-motor centres, and it is by this central character of the lesion that he attempts to explain the symmetry observed."

Mr. H. H. CLUTTON contributes a very interesting report of a case of *Paralysis of the Serratus Magnus Muscle*, which he says is generally described as a case of displacement of the scapula by the lower angle being slipped over the edge of the latissimus dorsi. The deformity resulting from this lesion is illustrated by three woodcuts, and its mechanism is carefully demonstrated. A valuable bibliography is also appended.

The volume concludes with the usual tables with reports of the surgical cases treated in the hospital.

H. R. W.

ART. XXXVI.—*A Handbook of Hygiene and Sanitary Science*. By GEORGE WILSON, M.A., M.D., F.R.S.E., Fellow of the Sanitary Institute of Great Britain, etc. With plates. Fifth edition, enlarged and carefully revised, 12mo., pp. 512. Philadelphia: P. Blakiston, Son & Co., 1884.

THE fifth edition of this valuable handbook is a volume similar in size and appearance to the late editions, but bearing evidence of considerable revision and additions, which, we think, improve the usefulness of the work. The introductory chapter has been entirely remodelled; the consideration of subjects more properly belonging to the domain of domestic hygiene has been omitted, and in its place has been introduced an historical sketch of sanitary science from the earliest ages to the present time.

In former editions the absence of practical instructions upon the methods of making sanitary examinations of dwellings marred the completeness of the work. This omission has been supplied by an addition to the chapter on dwellings of a section on this very important subject.

The author has availed himself of the recent and valuable reports of Dr. Thorne on infectious hospitals, so as to enrich the section on hospitals for cases of infectious diseases with material of great practical value. It is not long since little or no provision was made for most cases of infectious diseases other than that afforded by general hospitals. We have seen

cases of variola treated in the general wards of a prominent Paris hospital. This reckless disregard of measures of prevention is yielding to wiser counsel, and the tendency now is towards isolation in separate buildings. The information contained in this chapter upon the construction and arrangement of hospitals and ward pavilions for infectious cases is timely and to the point.

A separate chapter on vital statistics has been added to the present edition. The subject is treated in a plain and practical manner; and although the practices recommended follow closely those pursued in the office of the Registrar General of England, they are such as are generally adopted in this country, and their elucidation in this compact form will be of advantage to those engaged in the collection and compilation of vital statistics.

The last eighty-two pages of the volume are devoted to an exposition of the duties of medical officers of health as defined under the various public health acts, and to an Appendix, containing official memoranda and data for the guidance of sanitary officers. Whilst the information here detailed relates specially to measures instituted by the Local Government Board of England, it is so rich in suggestions and valuable hints of practice as to command the attention of every one on this side of the Atlantic who is interested in sanitary administration.

The work has been kept very well up to date, as far as relates to English progress; but there is little or no reference to recent advances made in sanitary science in this country.

The illustrations are conspicuous only by their paucity.

The book is an American imprint; the type is large and clear, and the paper good. A carefully arranged index, and a most copious table of contents, give completeness to this very valuable work. W. H. F.

ART. XXXVII.—*Opera Minora: A Collection of Essays, Articles, Lectures, and Addresses, from 1866 to 1882 inclusive.* By EDWARD C. SEGUIN, M.D., Clinical Professor of Diseases of the Mind and Nervous System in the College of Physicians and Surgeons of New York, etc. 8vo. pp. x., 687. New York: G. P. Putnam's Sons, 1884.

THIS work, modestly styled by Prof. Seguin *Opera Minora*, is a highly valuable collection of miscellaneous medical contributions. Close and careful clinical and therapeutical work of the highest practical character; important pathological observations, including microscopical research; and papers enforcing and illustrating physiological methods as applied to clinical study constitute the bulk of the volume. The lectures and other articles on cerebral localization stand in the first rank of contributions to the now copious literature of this subject. The book abounds in neurological work of the character which commends itself both to the specialist and the general practitioner. The profession is to be congratulated on the opportunity afforded of obtaining in convenient form the work of one of the first neurologists of the times. C. K. M.

ART. XXXVIII.—*A Manual of Obstetrics*. By A. F. A. KING, M.D., Professor of Obstetrics and Diseases of Women and Children in the Medical Department of the Columbian University, Washington, D. C., and in the University of Vermont, etc. Second edition, 12mo. pp. 338. Philadelphia: Henry C. Lea's Son & Co., 1884.

WE had occasion to review the first edition of this little manual for the July number of this Journal, 1882, and at that time pointed out several sections for correction or improvement. In the edition just issued the author has emended the points noted, and has increased the volume somewhat by enlarging the page and adding thirteen more pages. The design of Prof. King was to furnish the medical students of the two colleges in which he lectures with an obstetrical analysis, giving in few words the leading points of the three text-books of Playfair, Leishman, and Lusk, so as to provide them and also the busy practitioner with a ready remembrancer upon obstetrical matters. In a series of short paragraphs, and by a condensed style of composition, the writer has presented a great deal of what it is well that every obstetrician should know and be ready to practise or prescribe. The fact that the demand for the volume has been such as to exhaust the first edition in a little over a year and a half speaks well for its popularity. We have before stated that we are not in favour of manuals, intended to act as condensed text-books or treatises, and in lieu of them; but the work before us aims lower, and is intended to point out the way for a higher study, being simply a framework or foundation for a more substantial knowledge and an incentive to study what is afforded by valuable monographs and more elaborate treatises. R. P. H.

ART. XXXIX.—*Medical Diagnosis; a Manual of Clinical Methods*. By J. GRAHAM BROWN, M.D., late Senior President of the Royal Medical Society of Edinburgh, etc. etc. Second edition. Small 8vo. pp. 370. Edinburgh: Bell & Bradfute, 1883.

It is perhaps an open question whether the abundance of small books on diagnosis, which crowd each other in quick succession upon the editorial table, is due to an actual demand for them on the part of the profession, or to the facility with which they can be made.

The "busy practitioner" has little use for them; the trained clinician none whatever; while the student, for whom they appear to be especially designed, if in truth a student, speedily finds them inadequate to his wants in some, if, indeed, not in all, of the departments of which they treat. We confess to a suspicion that the author, in addition to his toil, occasionally shares with the enterprising publisher the expense of setting before the patient public those ever new rearrangements of familiar facts.

Nevertheless, comfort is to be taken in the manifest improvement in the quality of this kind of literary wares. Dr. Brown's book, which has speedily reached a second edition, is not only among the very latest of the books of this kind, but it is a pleasure to be able to say of it that it is among the very best of them. It is well arranged and well written, and shows throughout a power of condensation altogether exceptional. The methods of medical diagnosis now available, and the instruments in use for clinical investigation, are clearly and briefly described. J. C. W.

QUARTERLY SUMMARY
OF THE
IMPROVEMENTS AND DISCOVERIES
IN THE
MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

The Uterine Mucous Membrane.

A RECENT number of the *Zeitschrift für Geburtshülfe und Gynäkologie* contains a paper on this subject by Dr. THEODOR WYDER, of Zurich. He commences with a criticism of the observations of others on the point, and takes exception to most of them on the ground that sufficient care has not been taken to discriminate the effects of disease and of post-mortem alterations from physiological changes. He admits some few former descriptions as valid, and has made observations on nine women himself. His own were made in the following manner. He chose women in health and menstruating regularly. During menstruation a speculum, not oiled, was passed, and the blood and mucus oozing from the cervical canal were collected with a glass rod or a syringe, neither instrument being oiled, and care being taken not to let it enter the cervical canal lest any cervical structures should be accidentally detached. The blood and mucus thus procured were examined microscopically. He comes to the following conclusions: 1. During menstruation a part of the superficial layer of the mucous membrane is destroyed, while the rest persists. This removal of the superficial layer of mucous membrane takes place to a different degree in different cases, sometimes being complete, sometimes "minimal." The separated layer in part retains its structure, in part is broken up into detritus, in some cases small bits of mucous membrane, in structure like the membranes of dysmenorrhœa membranacea, but causing no pain on account of their smallness, being found in the menstrual discharge. 2. The separation is a consequence of the menstrual hemorrhage, and not of primary fatty degeneration. This latter is rather a consequence of the detachment and breaking up of the mucous membrane effected by the bleeding. 3. The superficial and middle layers of the remaining mucosa are composed of small cells, and have no resemblance to the decidua of pregnancy; while in the deeper layers there is a cellular hyperplasia of the interglandular tissue plainly intended to reproduce the tissue cast off during menstruation. 4. The regeneration of superficial epithelium takes place both from the glandular epithelium, and from the larger or smaller islets of superficial epithelium that may remain.—*Med. Times and Gaz.*, Jan. 26, 1884.

MATERIA MEDICA AND THERAPEUTICS.

Aconite and Aconitine.

MM. LABORDE and DUQUESNEL have recently made very complete studies of the aconites and aconitine.

Crystallized aconitine exerts a preponderating action on the central nervous system, and particularly on the isthmus of the encephalon and the spinal cord; as to the other parts of the organism, aconitine only affects them through the intermediation of the nervous system. After the administration of aconitine, one observes modifications in the different sensibilities (as for pain, special and reflex sensibility). The sensibilities are at first excited and perverted, and then diminish and disappear temporarily. The functional troubles are due to the influence of the drug on the conducting properties of the central nervous system, and not on the nerves themselves. The motor properties of the nerve are not injured generally, not more than the muscular contractility which persists up to the end. But it must be noted, besides, that there is a certain amount of ataxia and incoördination characterized by spasms and irregularity of muscular contractions and associated movements.

In studying the action on the heart and circulation, there is first observed a true ataxia, a sort of tetanization of the heart, which are at first accelerated and irregular, but become regular a little later, and diminish in frequency while at the same time the cardiac pulsations increase in amplitude; it is only at the last stage of intoxication that the heart ceases to beat. These modifications cannot be attributed to the direct action of the drug on the cardiac fibre; they are produced by the intermediation of the bulbo-spinal system, and death cannot be regarded as due to primitive arrest of the heart, since the muscular contractility of the organ is not affected, and may be awakened by the electric current some moments after death. The blood-tension is at first increased, but then diminishes, and the temperature follows an analogous course. Furthermore, the drug has quite remarkable vaso-motor properties; it is vaso-constrictor, and this property is in accord with the fact of the lowering of the blood-tension.

The respiratory function is rapidly influenced by aconite; the movements become irregular in number and rhythm, the muscles of respiration are contracted, tetanized, and in such a spasmodic state that the function is no longer performed, death taking place from asphyxia. This is the general termination in cases of aconitine poisoning; hence the great utility of artificial respiration in these cases.

Among the digestive disturbances caused by the drug, are diarrhœa and vomiting, due to the irritative action of the poison on the gastro-intestinal mucous membrane.

The pupil, at the beginning, passes through stages of contraction and dilatation with a tendency to myosis, and finally becomes widely dilated.

As to its actions on the secretions, there is abundant hypersecretion of saliva, the amount of urine is increased, and a small quantity of the drug is found in this fluid. It seems, however, to accumulate in the liver, and is chiefly eliminated by the bile, the secretion of which is considerably increased.—*Revue Scientifique*, January 5, 1884.

The Toxic Action and Therapeutic Use of Bichromate of Potash.

The toxic action of this drug has been clearly shown by reported cases of accidental poisoning, and by experiments. The results of the experiments made by

VULPIAN accord with the principal points indicated by Orfila in his *Traité de Toxicologie*. He used the salt subcutaneously on five dogs, a rabbit, and several frogs. Vomiting, diarrhœa, bloody stools, great general feebleness, general clonic movements, and more or less rapid death were the results. The autopsies showed a red coloration of all the muscles; heart and lungs sound; in the liver there were yellowish spots on a red surface; the hepatic cells contained numerous fatty granules; kidneys red; spleen normal; gastric and intestinal mucous membrane congested, but not ulcerated.

The symptoms and anatomical lesions were pretty much the same in dogs and rabbits. The blood, on microscopic examination, presented nothing abnormal. There were convulsions in some of the animals. There were no convulsions in the frogs, but a progressive feebleness of the general movements, feebleness and irregularity of the respiratory movements, arrest of the heart in diastole, with subsequent arrest of the lymph hearts. The colour of the blood showed that there was some alteration of that liquid.

Priestley drew the following conclusions from his experiments: The nerve centres are at first excited, then depressed; in the rabbit and guinea pig, there are at first, convulsions, then paralysis, principally of the *posterior* limbs; in the frog, tetanic contractions of the *anterior* members; disappearance of the reflex actions when the nerve trunks are stimulated by electricity, in consequence of which the nerve centres are affected before the peripheric nerves and the muscles. There is no special action on the heart, which is only altered by the blood-changes. Vulpian states that bichromate of potash acts on the nervous system, first causing excitation, and then depression. It appears to be certain that the salt acts on the extremities of the nerve fibres in the mucous membrane of the stomach and intestine. There is, therefore, it would seem, but little solid support for the therapeutic employment of bichromate of potash.

Medullary Affections.—M. Vulpian administers the bichromate of potash in pills, the dose not to exceed gr. jss in cases of *tabes dorsalis*, and he gives it in the intervals of the suspension of other more efficacious remedies (iodide of potassium, nitrate of silver), the intermittent use being more advantageous than the continued employment. It has never in this dose given rise to any toxic phenomena.

Gastric Affections.—Bichromate of potash, commencing with doses of gr. $\frac{1}{3}$ or $\frac{1}{4}$, and gradually increasing to gr. $\frac{1}{2}$ or jss, has given good results in cases of dyspepsia. The author of the paper specifies further, that there are patients in whom the digestive troubles are such that it is a question whether there is not some neoplasm of the mucous membrane of the stomach. It is easily seen from this, that Vulpian was thinking of the case of the Count de Chambord. He gives four cases, of which three at least showed favourable results from bichromate treatment. In another, a case of cancer of the stomach, the drug had a favourable, though passing effect. Vulpian thinks that whatever effect is produced is due, not to the direct contact of the drug, but to absorption. This theory is supported by the favourable effects of the drug on neoplasms situated at a distance from the digestive apparatus.—*Gaz. Hebdomadaire*, December 14, 1883.

Hypodermatic Use of Kairin.

Dr. QUEIROLO has recently suggested the hypodermatic administration of kairin. The solution which he uses contains from gr. jss to gr. viijss in Mxvj of water. In these doses the drug is not soluble in cold water, so that it should be heated. At the time of the injection the liquid should be at a temperature of

85° to 95° Fah. These injections have, in the hands of Queirolo, caused no general or local accidents. Larger doses only produce a slight local pain, which soon disappears.

The injection of gr. jss of kairin only produces a slight lowering of the temperature, and only for a short time. The injection of gr. iij produces a maximum abatement of the temperature of about seven-tenths of a degree (C.); this abatement beginning in about half an hour, and ceasing in about two hours. The abatement produced by an injection of gr. ivss has a maximum of about 1½° C., commencing within about half an hour and lasting about two hours. The injection of gr. vijss produces an abatement of from 1° to 2.4° C.; this commences soon and lasts two or three hours. When gr. xv are injected the temperature is lowered from 2.5° to 5° C.; the abatement lasts about five hours.

Queirolo, whose experiments have been made in the clinical service of Prof. Maragliano, concludes that kairin, used hypodermatically, produces a more rapid and lasting fall of temperature than when administered per ore; and that by this method the necessary doses are smaller.—*Gazz. Degli Ospitali*, Dec. 19, 1883.

Salicylic Acid as a Food Preservative.

Prof. BROUARDEL has recently published the conclusions of the Comité Consultatif d'Hygiène Publique on this subject.

He observes that, although the beneficial operation of salicylic acid in certain diseases is fully admitted, the theory of its action is very imperfectly understood. It is known, however, that when introduced into the economy it is eliminated by the kidneys and liver; and its warmest partisans admit that its use is contra-indicated in the subjects of those diseases, which prevent its due elimination, and thus give rise to an accumulation that in several instances has proved fatal. Moreover, elimination is sometimes impeded from unknown causes in persons in whom the functions of these organs work healthily; while in aged persons it is always very slow. Under any circumstances, only a portion of the salicylic acid is eliminated, the remainder undergoing combinations in the tissues, which, although they may prove therapeutically useful, and even for a time produce no evil consequences, could not be indefinitely prolonged without mischief ensuing.

Even small doses of the salicylate may prove dangerous to persons who eliminate it imperfectly; and Prof. Brouardel's investigations during several years past lead him to believe that the number of such persons is largely on the increase. Since 1861 he has analyzed the urine of all patients entering his hospital service, and his registers show that the frequency of albuminuria has more than doubled during the last twenty years. Now, these patients are not all condemned to an early death, for many recover, and others live for many years; and when examples are adduced of young and robust persons tolerating the daily use of from four to six grammes of the salicylates for months or years, we must not forget the aged persons and albuminurics, and individuals the subjects of various kinds of hepatic and renal disease, whose lives might be seriously compromised by such a regimen. The committee, therefore, believing that for such persons the daily use of salicylic acid would be highly dangerous, while even for those in good health there is no proof that it would be innocuous, recommend that its present prohibition should be maintained.—*Medical Times and Gazette*, Feb. 16, 1884.

Coto, Cotoïne, and Paracotoïne.

Under the names coto-coto and quina-coto, a bark was introduced into Europe several years ago, the family of which is still undetermined. Wittstein believed that it belonged to the lamineæ or terebinthaceæ.

Chemical Properties.—Two varieties, *coto vera* and *paracoto*, are distinguished. Cotoïne, first isolated in 1875, by Jobst, of Stuttgart, is the active substance of *coto*. According to Würtz, pure cotoïne crystallizes in yellowish quadrangular needles, fusible at 130° C.; it is soluble in boiling water, alcohol, ether, and chloroform, sparingly soluble in cold water, benzine, and petroleum. The taste is bitter. The alkalies dissolve cotoïne giving a yellow colour; acids precipitate it from this solution. Concentrated nitric acid dissolves it with a blood-red colour; concentrated sulphuric acid with a brown colour, and hydrochloric acid with a pure yellow colour. The aqueous solution is neutral. A number of other substances have been separated from the bark besides cotoïne.

Paracotoïne was isolated from *paracoto* in 1876, by Jobst and Hesse, as were also other substances, such as oxileucotoïne, leucotoïne, hydrocotoïne, etc., which have also, according to Burkhart, an antidiarrhœal action, but much less pronounced. Paracotoïne is a crystalline powder of a yellowish-white colour, insipid taste, and a peculiar slightly balsamic odour. It is very sparingly soluble in water, is soluble in boiling alcohol, in chloroform, concentrated solutions of sulphuric and nitric acid, and very soluble in ether. It is insoluble in ammonia, sparingly soluble in cold alcohol, benzine, petroleum, and boiling water. It differs then from cotoïne by its less solubility, and by the absence of colour reaction with nitric acid.

According to Pribram, cotoïne is antiputrescent and antizymotic; but Albertine declares that its anti-fermentative action is but little pronounced.

Physiological Properties.—Doses of gr. xv. of cotoïne produce no toxic effect on rabbits, according to Burkhart. In doses of gr. jss–ijj, repeated several times a day, given to a healthy man, it increases the appetite, without causing constipation; it is insoluble in gastric juice, but is soluble in the intestinal fluids; according to Albertoni, it dilates the abdominal vessels, and produces a modification and regeneration of the physiological functions of the intestinal epithelium; a lowering of the temperature (Burkhart); it has no action on the peristaltic movements of the intestine; but, according to Fronmüller, it has antisudorific properties, and according to Albertoni, is antisialorrhœic. It is eliminated by the urine. Burkhart and Pribram state that there is a diminution of indican.

The physiological effects of paracotoïne are the same as those of cotoïne, but less marked; it also lowers the temperature.

Administration and Formulæ.—Gielt considered *coto* as a specific against diarrhœa, and he was the first to utilize it in Europe. He gave it in powder, in doses of gr. vijss, four or six times a day, and in tincture (one part of the bark to nine of alcohol at 85°) in doses of gtts. x, every two hours. Parsons, Fronmüller, Yeo, and Rohrer have used the following preparations with advantage:—

R.—Fluid extract of *coto*, gtts. vj.

Compound tinct. of cardamom, gtts. lx.—M.

triturate with

Mucilage of acacia, f ʒijj.

and add

Simple syrup, f ʒij.

Water, f ʒvj.

S. A tablespoonful (Burney Yeo).

R.—Cotoïne, gr. j–jss.

Alcohol (rectified), f ʒijss.

Syrup, f ʒj.

Distilled water, f ʒiv.—M.

S. A dessertspoonful every hour (Burkhart).

R.—Cotoïne, gr. ivss.

Divide into three papers. To be taken in wafers.

R.—Cotoïne, gr. ivss.

Gum emulsin, f ʒvj.—M.

To be taken four times a day (Albertoni).

R.—Cotoïne, gr. vj.

Pure cotoïne, gr. xv.

Subnitrate bismuth, ʒiv.

Mucilage, f ʒvj.—M

S. For deep injection every half hour or every hour.

Burkhart and Jobst, who highly recommended the last in cholera, recommend the addition of f ʒss-f ʒj of chloral to alleviate the pains, and an increase in the dose according to the gravity of the disease, the preparations of coto having no narcotic or other bad action.

Therapy.—Cotoïne and paracotoïne are chiefly used in diarrhœa (without intestinal ulceration), complicating the different forms of mental alienation, phthisis, pillagea, etc. It is contraindicated in the catarrh of alcoholics and those suffering from cirrhosis. They have been used in cholera, in the night sweats of phthisis, in infantile diarrhœa, and in sialorrhœa. Riggi believes that cotoïne is sometimes indicated in chronic intestinal catarrh.—*Le Progrès Méd.*, Dec. 22, 1883.

— *Transfusion as a Hæmostatic Means.*

In the *Revue Scientifique*, No. 3, July, 1883, appeared an abstract of Professor HAYEM's paper, *The Formation of Intravascular Blood-concretions*.—Having been asked how the injection of blood into the circulation could have a hæmostatic effect, he was led to make the experiments the results of which were embodied in the above paper. This paper, he says, does not appear to have become generally known. It contains, however, facts of wide applicability to human pathology, and may be equally considered as a contribution to the experimental study of hæmostasis.

It occurred to Hayem, in 1882, that the blood, containing living and active hæmatoblasts, should have a more marked influence on the coagulability of the blood than other intravascular injections. The experiments referred to, in which he studied the influence of distilled water, artificial serum made with chloride of sodium, blood-serum taken from an animal of the same and of a different species, natural serous liquids not spontaneously coagulable, solution of fibrin-ferment, natural blood, and defibrinated blood, led him to his present opinion. The most active of all these is blood-serum. It is important, however, to remark that the modification produced in the coagulability of the blood by intravascular injections is only evinced, in the living body, in stagnant blood in the interior of vessels. Furthermore, we will observe the singular fact of almost immediate coagulation of stagnant blood in a vascular area, while apparently nothing occurs in the general circulation; and to obtain this result it is sufficient to inject a few cubic centimetres of serum into the blood. From this it must be concluded that the hæmostatic effect is only sensible in the vascular areas in which the blood is arrested or slowed in its course.

The following is quoted from Hayem's paper referred to above: "The possibility of rendering stagnant blood more coagulable, by introducing into the vessels liquids not hurtful to the organism, is applicable, in therapeutics, to the treatment of severe hemorrhage and perhaps also to the treatment of aneurisms. In this lies, to some extent, the experimental demonstration of the existence of

active hæmostatic procedures and of agents, which, combined with the means employed for slowing the course of the blood, may favour the formation of clots in aneurismal vessels. In all these cases, my experiments having been made with liquids utilized in the various methods of transfusion, it appears certain that the principal practical result of these operations consists in the increased coagulability of the blood. This will be especially applicable in cases of severe hemorrhage in which the blood has become less coagulable, and when there is a necessity of furnishing a renewed quantity of liquids to the circulatory apparatus."

To obtain the maximum useful effect, it is necessary, as Hayem has already remarked, to use serum, that is to say, the natural liquid which, according to A. Schmidt, contains the larger proportion of the undetermined material to which he has given the name fibrin-ferment. Natural blood is one of the less active agents for this purpose; defibrinated blood, artificial serum or distilled water, is more active but less so than serum. Instead of using serum of human blood it has been suggested to use the blood-serum of other animals, but this may cause serious accidents. By injecting the blood-serum of a beef into the blood of a dog, death has been caused in a few hours, the symptoms being analogous to those of purpura hæmorrhagica. This pathological state is the consequence of a variety of coagulation which Hayem calls "coagulation by precipitation." The effect of the blood-serum of another kind of animal on the circulating blood is such that the latter immediately becomes filled with thousands of concretions which are arrested in the small vessels, and numerous hemorrhagic infarctions are produced.—*Gazette Hebdom.*, Feb. 1, 1884.

Washing out the Stomach; Alimentation and Suralimentation.

The invention of Faucher's apparatus—the funnel and tube—for washing out the stomach has almost completely cleared away the dangers formerly attendant upon the operation, and has again brought it into favour. This apparatus consists of an elastic tube which acts as a siphon, the fluid being poured into a funnel at the outer end. An index marks the length of the part introduced into the stomach. The introduction of the tube presents certain difficulties to those unaccustomed to its use. The patient's head must be raised, and thrown slightly backward; the tongue drawn slightly forward as in a laryngoscopic examination; the tube should then be rapidly introduced as far as the pharynx, and carried gently over the epiglottis. Here it is stopped for an instant, especially if the patient is nauseated by the foreign body. The patient is then told to take a deep inspiration and to swallow, so as to draw in the tube, which the operator assists by gentle pushes. If the tube be suddenly arrested, it is drawn back a little, the patient again told to swallow, and the tube pushed gently downward as before. When it reaches the stomach, it should be left alone for about twenty seconds; then the washing out is commenced. For this, the operator gently pours about a quart of the selected fluid into the funnel, and the liquid slowly runs down. At the very instant that the last part of the water is running through the bottom of the funnel, it is quickly reversed and turned upside down in a basin placed at the level of the stomach; the siphon action now begins, and the stomach is soon emptied; this is repeated until the water returns clear.

The operation does not, however, always succeed so well. The pharyngo-œsophageal spasm, which first arrests the tube, may continue, and become so violent that the tube is pushed back. It is always prudent, when this is violent and is accompanied by nausea and dyspnœa, to desist, and give bromide of potassium gargles for three or four days. Dr. Adhoui objects to this method of washing because it does not always clear the stomach of glutinous and adherent materials

which are found in the stomach. He uses a sound formed of two tubes of unequal calibre. These are joined together at the parts which enter the stomach, but are separate outside. The large tube reaches to the bottom of the stomach; the smaller only through the cardiac orifice. The liquid runs in through the small tube. The stomach is filled, when the patient is told to cough slightly, and the liquid is forced out of the larger tube, and, the other end having been lowered, the stomach is emptied. In ordinary cases Faucher's apparatus suffices, and the patient is soon able to introduce the tube for himself.

Vichy, Vau, or Châtel-Guyon waters, which are excellent for this purpose, may be replaced by alkalized water. 3ijs of sulphate of soda may be added to a quart of water, and this solution used. If the operation causes pain in the stomach, a few drops of tincture of belladonna or laudanum may be added to the water. Dujardin-Beaumetz advises milk of bismuth prepared by adding 3v of subnitrate of bismuth to a pint of water. In case of hemorrhage, water containing about a teaspoonful of the solution of the perchloride of iron to the quart may be used. Grs. xlv of boracic acid added to a quart of water is an excellent preparation when the gastric secretions have a bad odour. In these cases Dujardin-Beaumetz uses resorcine in the same preparation.

Washing out the stomach is indicated in chronic gastric catarrh, and inveterate dyspepsia with dilatation, and in all rebellious gastric troubles. It has been of service in cancer of the pylorus with dilatation of the stomach, when the organ, filled with undigested and fetid materials, can only be relieved by painful efforts at vomiting. In the case of a patient troubled with internal strangulation, the stomach was washed out regularly every morning with Vichy water, and the fecal vomiting ceased, the patient eventually recovering. The same indications exist in cases of fecal vomiting from strangulated hernia and intestinal obstruction, or in strangulation from any cause. In cases of poisoning, washing out the stomach may be of great value; for the poisonous substance may be removed from the stomach, and the antidote may be applied to its mucous membrane, especially when it is desired to introduce medicaments which may reduce inflammation and prevent the formation of large cicatrices. It is useful, also, in these cases, as a means of introducing food into the stomach, when deglutition is painful or impossible. Very great care is needed in these cases, however, to prevent penetration of the altered tissues by the sound. Probably the most important outcome of this method is the method of artificial alimentation, which has been brought to such perfection by Debore. Artificial alimentation is applicable in cases characterized by the feebleness and inanition caused by chronic diseases. It acts, not by providing a specific against the disease, but by sustaining the life of the patient, building up his strength, re-establishing his digestive forces, and favouring the curative effort of nature by giving the time necessary for the reparative work.

Food is readily introduced into the stomach by this means, and in considerable quantity. When it is badly tolerated, the stomach should be washed out before the introduction of the food. The association of subnitrate of bismuth, laudanum, etc., with the food is disadvantageous.

In a general way, all diseases accompanied by complete anorexia and incoercible vomiting are indications for artificial alimentation if not suralimentation. It is well known that anorexia accompanies certain cases of ataxia, convalescence from typhoid fever, and hysteria. It would seem that a rich field for the use of this method would be the uncontrollable vomiting of pregnancy, more especially in cases in which premature delivery seems to be the only chance of saving the patient.—*Gazette Hebdomadaire*, December 7, 1883.

Effect of the Intravenous Injection of Various Substances.

MIGLIORANZA, in the *Archives Italiennes de Biologie* (tom. iv., fasc. 2), having practised a series of experiments in which he injected milk into the veins of dogs, draws the following conclusions. It is a mistake to inject milk instead of blood into the veins of an animal; for milk must be digested to become an aliment, and if it be injected its albuminoid and fatty matters simply pass out of the body by the urine. Sugar of milk transfused into the veins passes in part into the saliva, for dogs in which this operation has been performed may be seen to lick their lips as if they perceived a sweet taste. The presence of a notable quantity of milk in the blood before this milk has undergone the appropriate digestive processes is unassimilable and hurtful; it produces vomiting, diarrhœa, prostration, and ultimately even death. The butyric element of the milk transfused into the blood without antecedent digestion produces fatty renal infiltration and chyluria, notwithstanding antecedent filtration of the fluid injected.

In the treatment of cholera the transfusion of serum, as recommended by Albertoni, might be employed, but not the transfusion of milk, as Thomas has suggested. In anæmia the transfusion of blood may no doubt be adopted; but not of milk, since the latter contains no blood-corpuscles, but only adipo-caseous globules. The filtration of fat casein or of milk transfused into the veins takes place through, and by means of, the kidney, without any augmentation of the blood-pressure in the capillary circulation of the kidneys; indeed, it might be said, under condition of diminished pressure. Dr. Miglioranza thinks that the accidents of chyluria and of albuminuria in certain morbid states may depend also on stasis of blood or on dilatation of vessels. The sudden introduction of a large quantity of milk into the circulation produces great diminution of blood pressure, due to collapse of the force of the cardiac systole. Before injecting milk into the blood it should be filtered, to prevent corpuscles larger than those of the blood from being present, which might cause obstruction in the pulmonary and cerebral circulation. But even when this filtration is effected an abundant and direct transfusion of milk into the blood is always followed by inconvenience and danger. The proposition made by Albertoni that the serum of milk, and not pure milk, should be injected into the veins of those affected with cholera is good, for none of those ill effects are then likely to follow which are attributable to the fatty parts of the milk; and in point of fact Albertoni has actually injected from 90 to 100 grammes of serum of milk into the veins of dogs without observing any ill effects. Casein introduced directly into the blood, after being digested, is transformed into urea rather than into pabulum for the tissues. Hence much urea is found in the urine of dogs after the intravenous injection of milk. From all this it is evident that the fat and casein of milk transfused into the blood before being digested represent an unassimilable material which is discharged from the organism. If the animals experimented on by Thomas did not die, it was because he only injected very small quantities of milk; and even such quantities, as Laborde has shown, may occasion serious accidents. Carbonate of ammonia introduced into the blood, notwithstanding the opposite statement of Ritter and Feltz, produces symptoms that precisely resemble those of uræmic fever, or ammoniæmia—viz., tetanic convulsions, dyspnœa, excitement of the circulation, hyperæsthesia, and coma. When urine decomposes in the bladder and ureters, with development of ammonia, this substance, observed as it is readily by the blood, causes the serious symptoms that are observed in diseases of these organs. Urine directly injected into the blood is not poisonous, but when the products of its decomposition are injected these deleterious effects are immediately displayed. The presence of bile, if in sufficient quantity in the stomach, is poisonous.

Cholesterin is very poisonous when it is in quantity slightly above the normal. The bile is probably the means by which it is eliminated. The presence of aromatic substances in the blood is not poisonous. The asphyxial form of acute alcoholic poisoning is probably due to the transformation of alcohol into aldehyde. *Lancet*, February 2, 1884.

MEDICINE.

Limited Laryngeal Paralysis.

IN a recent number of the *Berliner klin. Wochensch.*, has appeared a long paper by Dr. FELIX SEMON, in which he gives an able review of the facts bearing upon the assertion, which he was the first to make some three years ago, that in all cases of organic disease or injury of the motor nerves of the larynx there is either palsy of the abductor muscles alone, or these muscles are affected earlier and more severely than any others. At the time of his first paper, published in the *Archives of Laryngology*, July, 1881, Dr. Semon was able to report twenty-two cases, completed by autopsies in ten instances, supporting this statement; he now adds thirty-six new cases with eleven autopsies, making a total of fifty-eight cases, of which, in twenty-two, a careful autopsy has been made. These cases have also been observed by such competent authorities as Gerhardt, Riegel, Penzoldt, Mackenzie, Moxon, Hilton Fagge, Ord, Dreschfeld, Remak, F. Taylor, Whipham, and others. They include cases of encephalitis, cerebral syphilis, disseminated cerebro-spinal sclerosis, general paralysis, apoplexy, disease of pons and medulla, tabes dorsalis, lead-poisoning, goitre, cancer of the thyroid, enlargement of the bronchial and cervical glands, pulmonary tuberculosis, chronic pneumonia, aneurism of the aorta and of the innominate artery, lympho-sarcoma of the anterior mediastinum, cancer of the œsophagus, and typhoid fever. Various as are these primary diseases, it is shown that in all of them, when either of the motor nerves of the larynx—the spinal accessory, pneumogastric trunk, or recurrent branch of it—is affected, the palsy involves primarily, chiefly or solely, the abductor muscles of the glottis. Schnitzler and Solis Cohen, Jr., have recorded cases in which they allege there was isolated adductor paralysis in organic disease of the motor laryngeal nerves. But after a careful review of these reports, Dr. Semon shows, in part from personal observation, that they are based upon insufficient evidence, and must not be held to invalidate at all his conclusions based upon a much larger number of cases and corroborated by many autopsies. In not one of the four cases of Schnitzler or Solis Cohen was there an autopsy made. It is generally admitted that in cases of soft lymphatic goitre isolated and varying paralysis of the adductor muscles may occur. Schnitzler attributes this to pressure of the enlarged thyroid upon the recurrent laryngeal nerves, but Semon holds that this palsy is functional, like all other isolated adductor palsies, and is to be attributed to transitory anæmia of certain regions of the brain; possibly this view gains support from the remarkable results of excision of the thyroid gland recorded by Kocher.

It is impossible to deny the force of the facts that Dr. Semon urges in support of the generalization which he himself fairly claims to have originated. The cases he records are alone sufficient to show the great practical importance of it. For it must be remembered, and this is by no means generally appreciated, that pure unilateral paralysis of the abductor muscle of the glottis does not interfere

with respiration or with the voice, and its existence may be, and often is, overlooked, simply because it is held to be unnecessary to examine the larynx thoroughly in the absence of special symptoms pointing to its affection. But Semon has demonstrated that the recognition of this isolated abductor palsy, which is often a very early symptom of obscure and grave organic disease, may be taken as absolute proof of the existence of such organic affection, and thus enable the practitioner to arrive at a diagnosis earlier than would be otherwise possible, and save him from errors in prognosis. Indeed, the facts warrant the examination of the larynx in all cases of disease of the brain, neck, and chest, in which the laryngeal nerves can be affected either at their centres or in any part of their course. To physiologists, however, Semon's law is of the deepest interest and importance; for it points to the conclusion that the ganglionic cells composing the nucleus of the spinal accessory nerves are strictly differentiated. Buzzard and Ormerod have shown reason for the belief that the same holds true in relation to the oculo-motor nerve centre; and it therefore becomes probable that the cells of the nuclei of all cranial and spinal nerves are strictly and exactly differentiated. The special proclivity of the abductor nerve-fibres to succumb to general disease, too, must not be regarded as a pathological curiosity, met with only in the larynx, but as the expression of a general law, which has been formulated by Ferrier, that all abductor and extensor nerves possess less vital resistance, and are sooner exhausted than adductor and flexor nerves. Dr. Semon does not in his paper enter upon the physiological explanation of the phenomenon as regards the larynx, but has reserved this for another occasion. The subject is one that by no means specially concerns so-called laryngologists, but, as the list of cases we have quoted shows, interests far more general surgeons and physicians, and moreover illustrates the importance of medical practitioners being able to investigate thoroughly all the organs of the body.—*Lancet*, Dec. 8, 1883.

Sciatic Neuritis.

An account is given in the *Gaz. des Hôpitaux* (No. 16), of a case of this description which came under Dr. Landouzy's care at the Charité. A woman, 33 years of age, but apparently much older, applied on account of an affection of the chest, and on examination manifested all the signs of extensive tubercular infiltration of the left lung. There was also remarkable atrophy of the right leg, and although the woman did not apply with respect to this, she admitted that for the last 18 months she had constantly suffered severe pain in this limb, whether she was using it or not, and at night as well as by day. The seat of pain was referred to the sciatic nerve at its exit, and along the course of its trunk and principal branches. This peculiar course and continuity of the pain were pointed out by the late Professor Lasègue as the means of diagnosing between sciatic neuritis and neuralgia, and Dr. Landouzy did not hesitate to attribute the present case to the former affection, especially as it was also accompanied by marked atrophy of the limb. As to the relation of the neuritis to the tubercular infection, it is to be observed that the patient, who had no family or personal history of phthisis, had cohabited with two men in succession who were the subjects of this disease; but she did not complain of her health until 18 months before her admission, when she became the subject of peritonitis, and afterwards of fistula in ano, for which she underwent operation. It was during this period also that the painful affection of the leg commenced, and that she was seized with cough and hæmoptysis. Dr. Landouzy does not hesitate to regard the neuritis as one of the localizations of tubercle, of which other examples are on record. Professor Peter, for example, in his *Clinique Médicale*, has shown by

several examples that disturbances in innervation of the highest importance may be produced in phthisis, and that they are associated with its most serious forms, or appear at the moment of definitive and hopeless aggravation of the tubercular disease—becoming an indication of the extreme gravity of the disease and of the approaching death of the patient. He refers to two such cases of sciatic neuralgia, or rather neuritis; at his instigation, M. Friot produced, in 1879, a thesis in which this point in the history of tuberculosis was examined. Among 137 cases of phthisis admitted into Professor Peter's wards in 1878, M. Friot met with four instances of the occurrence of sciatica in the course of phthisis, which, joined to Professor Peter's two cases, and five others reported elsewhere, form the material for his conclusions. In Professor Peter's two cases, and in three of those related by M. Friot, as well as in the one which forms the subject of his paper, the sciatica closely coincided with the commencement of the pulmonary tuberculosis. His conclusion is that sciatic neuritis depends upon a special anatomical lesion, such as tuberculosis, influencing the nervous substance or its coverings and acting upon neighbouring nerves. Two of his cases tend to prove that in tubercular sciatica there is always a changed condition of the spinal cord or its membranes, a condition of a variable character, but capable of producing secondarily a peripheral neuritis. Summing up the results of M. Friot's eleven observations, it seems that this neuritis may commence the series of affections associated with phthisis, or burst out during the course of the disease. The pains in place of being intermittent as in neuralgia are constant and very obstinate: and their appearance should give rise to the suspicion of tubercular change either in the cord or its membranes, or in the spinal column. They tend to aggravate the disease, and generally precede only by a short time the fatal termination. While in sciatic neuralgia we may obtain a cure by means of narcotics and antispasmodics, antiphlogistics furnish the only means of relieving the pains of neuritis, while a complete cure is in all cases unattainable.—*Med. Times*, Jan. 24, 1884.

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Angina Pectoris Immediately Followed by Pericarditis.

At the meeting of the Clinical Society of London, on January 25, 1884, Dr. DONALD HOOD related the case of a gentleman, æt. 65, who, while resting on a sofa, apparently asleep, was suddenly aroused by the window curtains being on fire. He quickly jumped up to extinguish the flames, and within half an hour after this exertion he was suddenly seized with severe heart-cramp. Seen shortly afterwards by Dr. Hood, he was noticed as being blanched, barely able to speak, heart irregular and fluttering, pulse of peculiarly low tension, with agonizing cramp-like pain over cardiac region. Hot stimulating applications, brandy, ether, and opium, were used freely, and the patient slowly lost the pain, and a general improvement of the circulation took place. Twenty-four hours after the commencement of the attack a soft pericardial shuffle was noticed; within a few hours it had deepened into a distinct rub. From this time during the succeeding ten days the case assumed all the characters of one of pericardial effusion; the amount of fluid being but moderate, and apparently completely absorbed within the ten days. A fortnight later the patient was found to have a systolic apex murmur, and symptoms of incompetency of the mitral valve rapidly developed. The patient died four months later from syncope, and at the time of death was the subject of cardiac dropsy. No *post-mortem* could be obtained. Dr. Hood suggested, as a possible explanation of the primary attack, with its subsequent train of symptoms, that the patient was the subject of some fibroid degeneration of the heart. Roused from sleep by the flames, his alarm and exertions caused a sudden distension of the heart cavities, which possibly gave rise to some lesion

of the visceral layer of pericardium, and so started the pericarditis. In support of this hypothesis, Dr. Hood called attention to the series of cases of fibroid disease of the heart, collected and published by the late Dr. Fagge in the twenty-fifth volume of the Transactions of the Pathological Society, and stated that in more than half of these cases the patients were found to have been the subjects of pericarditis. He further suggested that fibroid degeneration of the heart should be looked upon as a possible factor in those cases of pericardial effusion in which it was difficult to explain the cause of the pericarditis.

Dr. DE HAVILLAND HALL gave the details of a case seen by him five years ago, in which a man, aged 56, had suffered from severe pain in the præcordial region shortly after a violent and passionate altercation with his son. The pain was still present on the following day, but was somewhat relieved by the use of diffusible stimulants, and of morphia subcutaneously, but never quite disappeared. The sounds of the heart were then normal, and there was no rise of temperature. Within forty-eight hours signs of pericarditis became manifest, a moderate effusion took place, the patient became worse, and died in four or five days.

Dr. DUCKWORTH said that hitherto no clinical connection had been recognized between cases of genuine angina pectoris and pericarditis by any of the standard authors. The classical disease, angina pectoris, was generally relieved by the well-known remedies. But there were other forms of angina, and especially in connection with aortic disease, in which severe cardiac pain was set up, and he considered it possible that the cases related might have been of this class. Chronic mediastinal inflammation, disturbing the nerves of the part, might give rise to cardiac neuralgia. These cases, however, were different from those of true angina pectoris. He thought that probably very few physicians had seen many cases of the latter affection, whilst the occurrence of cardialgia must be familiar to most observers. Simple cardiac neuralgia, however, was not usually followed by pericarditis.

Dr. W. EWART thought that it would be of interest if evidence could be brought forward of the extent to which pathological changes on the heart and great vessels could give rise to symptoms. He had met with many instances of cardiac pain simulating neuralgia, brought on simply by excitement. It would be difficult to explain the occurrence of pericarditis from a purely functional cause; but he thought it possible that there might be an enlargement of the aorta within the pericardium, which, escaping detection, might suffer a slight rupture and so set up pericarditis. He would be inclined to attribute the sequence of events in these cases to some such coincidence.—*Med. Times and Gazette*, Feb. 2, 1884.

Interstitial Chronic Idiopathic Hypertrophic Myocarditis.

PETRONE reports the following case: A man, æt. 25, admitted after six months' illness, had not suffered from rheumatism, presented œdema of the ankles, moderate dyspnœa, cough and mucous expectoration; small, weak, quick pulse; sounds and impulse of heart feeble; liver enlarged. After a month's treatment with digitalis, quinine, etc., all these symptoms improved; but they soon returned in an aggravated form, with progressive enlargement of the cardiac dulness, pulmonary congestion and œdema, and a systole. *Post-mortem*, there was found to be hypertrophy of the heart, especially of the left side; the orifices and valves were healthy; the peripheral vessels were not atheromatous; the aorta was slightly atheromatous. On section, the cardiac muscle was normal in colour and hardness; examined histologically, the connective tissue separating the fasciculi of muscle-fibres was considerably increased. These fibres were so resistant, that with the forceps it was possible to detach the muscular elements

and to isolate the connective stroma. This tissue appeared so developed as to form extensive fibrous plates of various configuration, in the midst of which were seen the muscular fibres in various stages of atrophy. In the centre of each patch was found a small artery, surrounded by connective tissue, and radiating towards the periphery; the artery presented all the characteristics of endoperiarteritis obliterans. This history shows, according to Petrone (*Lo Sperimentale*, and *Annali Univ. di Med.*, Nov. 1883), that there exists a primary isolated cardiac cirrhosis, without renal lesion; the cause of this myocarditis being a diathesis, probably determined by cold and damp or alcoholism. The author quotes the opinion of Rigal, according to whom the alterations produced by the diathesis or intoxication (tobacco, gout, rheumatism, alcoholism, or lead-poisoning) are manifested primarily in the small arteries and capillaries of the cardiac muscle. The suppressed elasticity of these vessels creates an obstacle to the movement of the heart, and hence the hypertrophy. This hypothesis is probable, but not certain. The diathesis may display its influence both on the interstitial connective tissue of the heart-muscle and on the arterial walls, the hypertrophy being the effect of the diffused sclerosis of the myocardium. Certain symptoms render the diagnosis of this form of sclerosis possible: hypertrophy, weakening of the systole, absence of murmurs, disproportion between the enlargement of the area and the weakness of the cardiac impulse and radial pulse, the impossibility of deciding for any other disease of the heart, the absence of polyuria, attacks of pulmonary congestion which (as Rigal admits) depend on vaso-motor paralytic disturbances, slight dropsies, which disappear to reappear quickly, and the absence of albuminuria. Joined to a systole, it is impossible to distinguish it from other heart-disease. Treatment is impotent against this form, which inevitably leads the heart-muscle to progressive degenerative atrophy.—*London Med. Record*, Feb. 1884.

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Hemorrhage from the Hepatic Vein—Sudden Death.

Dr. ALFRED F. HOLT reports the following interesting case:—

J. C., æt. 56, died May 15, 1883. For the last six or seven years of his life he had been engaged in a small kindling-wood trade, doing some of the manual labour required by such a business himself. For the ten years before this time he had been a police officer.

Ten or twelve years before his death he began to have severe attacks of colic. These continued to occur at irregular intervals during his life, and for the last six or seven years he was never quite well, although able most of the time to attend to his business. During these years he had consulted a large number of physicians. Most of these pronounced his trouble gall-stones, but some of them dyspepsia, and still others some obscure disease of the liver.

Several days before his death he was suddenly prostrated with a very severe attack of pain in the region of the stomach, nausea, and faintness. He was taken to his home and his physician, Dr. Dow, who was immediately summoned, found him suffering from severe pain, vomiting at short intervals, pale, and faint. The pain and faintness continued until evening, he having been taken sick about noon, when the doctor was hastily called again. He found him vomiting blood in the form of very large dark clots. This continued at short intervals for about one hour, when it ceased. A little over three pints of blood were vomited at this time. The pain and faintness continued for three days. Although these symptoms were somewhat relieved by stimulants and opiates, at the end of this time he was again attacked with the vomiting of blood, as before, in the form of very large black clots. This continued at short intervals until nearly two quarts had been ejected, when it suddenly ceased; and after this he was very weak, faint,

and nearly pulseless. The pain continued a few hours after this vomiting, when it ceased. Although his mind was clear, he did not rally, but gradually sank, and died forty-eight hours later, or a little less than seven days from the commencement of the sickness. No blood was at any time passed by the rectum.

Autopsy.—The heart was seen to present a noticeably peculiar appearance, the right ventricle being distended so as to make a rounded prominence on its upper part near the auriculo-ventricular junction. The right auricle was also distended. Both of these distensions felt elastic to the touch. On opening this side of the heart there was an escape of a puff of gas, and the walls of the organ immediately collapsed. There was no blood in either of the cavities. The right ventricle was a little dilated, and its walls were slightly thinner than normal. Left side of heart empty. The whole organ was rather large. Its tissues were pale, but of a uniform colour. The valves were in every way healthy, and but little blood flowed from the cut ends of the large vessels.

The common bile-duct increased in calibre as it approached the liver, until it and the hepatic duct were dilated into a sac or pouch of about two ounces capacity. The walls of this pouch were very thick and hard, and there was a deposit of a dense tissue around them. At the lower side of this sac, near where the gall-bladder entered it, was a cup-shaped depression the size of half a chestnut. When a little water was poured into this a shreddy mass floated up, being attached to the sides and bottom (recent ulceration). On the upper side of this dilated duct, and immediately opposite where the bloodvessels entered the left lobe of the liver, was a similar spot of ulceration, somewhat larger and irregular in outline. On handling, a little blood was seen to flow from the bottom of this depression, and an opening was readily found leading directly into one of the vessels entering the left lobe of the liver.

This was believed to be a branch of the hepatic vein, but all of the tissues in this vicinity were bound together in such a confused mass that it was not quite certain. The gall-bladder was much thickened and contracted in such a way as to make its cavity very irregular, and of a capacity of not more than two or three drachms. Its mucous surface had wholly lost its honeycombed appearance. The opening between it and the sac was wide enough to readily admit the finger. Both the gall-bladder and sac when opened contained a little bloody fluid.

The cut surface of the left lobe of the liver was of a uniform greenish-brown slate colour, smooth but not glistening; and the contrast between it and the right lobe was very striking. It felt firm. The cut surface was of the same uniform greenish-brown colour. All appearance of structure had disappeared. A piece of this lobe could readily be broken with the hands; and the fractured surfaces had much the appearance of nearly dried piece of mud treated in the same way. The larger bloodvessels could be made out in the mass. They were filled with a dryish brown-red material that remained formed when turned out of the vessel, but readily crumbled in the hand into a coarsely granular mass. The main vessels entering this lobe of the liver near the ulceration above described were filled with the same material.

Unquestionably the source of the hemorrhage was the open bloodvessel supplying the left lobe of the liver; the blood readily finding its way into the duodenum by means of the largely dilated duct and its opening into the intestine, and through the rather open pylorus into the stomach. Why all of the blood should take this course and none of it go down the intestinal canal, as it apparently did not, is one of the points in this case seemingly worthy of discussion.

Of course the gas accumulating in the intestinal canal after death found its way by means of the same open vessel to the right side of the heart.

Hæmatemesis, with the blood coming from such a source, must be exceedingly rare, and so far as Dr. Holt can learn this case is unique.

The peculiar condition of the left lobe of the liver he has never seen before. He believes it to have been caused by a complete cutting off of the blood supply, producing a necrosis of the part.—*Boston Med. and Surg. Journ.*, Dec. 20, 1883.

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Icterus Neonatorum.

A recent number of the *Zeitschr. f. Geburtsh. u. Gynäk.* contains an article on the above subject by Dr. M. HOFMEIER, of Berlin. The writer first considers the theories hitherto advanced as to the production of this condition. It has been suggested, first, that it is due to changes taking place in the blood, leading to production and non-elimination of pigment. Dr. Hofmeier does not accept this view, because he finds no evidence of the supposed blood changes, or of the assumed deficiency in the emunctory organs. It has been also said to be due to pigmentary changes in capillary cutaneous extravasations produced during labour. Three points, says our author, tell against this—(1) there is in this disease coloration of internal organs as well as of the skin; (2) it is met with in small and premature children, as well as in those with whom labour has been protracted; (3) it is met with in children delivered by Cæsarean section, or by laparotomy, in cases of extra-uterine pregnancy. A third theory is, that it is due to diminution of blood-pressure generally, and therefore in the portal system, leading to re-absorption of bile. To this Dr. Hofmeier objects (1) that there is no proof that lowering of the blood-pressure does lead to re-absorption of bile; (2) that if it were so, in infants in whom the late ligation of the cord is practised, so that the blood-pressure in their circulation is little diminished, or even increased, jaundice ought not to be met with; whereas it occurs as commonly in them as in others. Virchow supposes, and so does Kehler, that icterus neonatorum is due simply to catarrhal swelling and occlusion of the bile-duct. Dr. Hofmeier accepts this as true for a few cases, but not for all. The latest explanation is that of Birch-Hirschfeld, who, basing his views on 600 post-mortem examinations, attributes the jaundice to compression of the bile-ducts in consequence of venous stasis in the liver. Dr. Hofmeier points out that such venous stasis implies grave disturbance in circulation and respiration; and while entirely accepting Birch-Hirschfeld's facts, he yet sees jaundice so often in children whose breathing and circulation are quite vigorous, that he thinks the post-mortem appearances in children who die do not account for the jaundice in robust children who live.

Finding, thus, that none of the explanations of icterus neonatorum hitherto advanced explain its occurrence in a satisfactory manner, Dr. Hofmeier has himself investigated the subject from a clinical point of view. He finds that with the jaundice of the new-born the following phenomena are associated: During the first few days of life the loss of weight which occurs in all children is in the icteric much greater than in others. There is also during the first nine days a greatly increased excretion of urea and of uric acid; and there are also appearances in the urine which (from a former investigation) he believes to indicate the presence of uric acid infarets in the kidneys. Albuminuria occurs more often in the icteric than in the non-icteric. In the jaundiced a yellow pigment is invariably present in the urine, to a degree corresponding to the intensity of the jaundice. These things indicate, he thinks, a considerable waste of the nitrogenous tissues; and this inference leads to the next question, viz., as to the cause of the waste. It might be due (1) to deficient quantity of nutrition, (2) to defective quality, (3) to mal-assimilation. These disadvantageous circum-

stances would be expected to more affect first-born and premature children, and those whose mothers were suffering from illness. Observation corroborates theory, for Dr. Hofmeier finds from statistics that among icteric children there are undue proportions of first children and of premature children, and that icterus is more often seen in lying-in hospitals than in private practice. Assuming, then, that there is an excessive waste of nitrogenous constituents, the question comes—on what tissue does this fall? Dr. Hofmeier answers—on the blood. It leads, in his view, to destruction of red blood-corpuscles; and it is the pigment derived from this disintegration that causes the jaundice. He points out that many blood-poisons—both chemical, such as phosphorus, and vital, such as the poison of pyæmia—produce jaundice as one of their symptoms; and some among these (*e. g.*, ether and chloroform) have been experimentally proved to cause destruction of red blood-corpuscles. Dr. Hofmeier has sought for direct proof of his theory by examining the blood. In the newly-born he finds these peculiarities present: less tendency to the formation of rouleaux, a greater resistance to the action of fluids which make the corpuscles swell, and a great variability in the number of white corpuscles. These changes he finds more marked in the icteric than in the non-icteric children.

From these facts Dr. Hofmeier draws the general conclusion that icterus neonatorum is intimately connected with certain phenomena depending upon tissue-changes, these changes themselves depending upon the state of nutrition; and further, that a connection between icterus and certain processes going on in the blood is unmistakable. The jaundice he believes due to the presence of bile in the blood, bile-pigment being present in the excreta to an extent proportionate to the depth of the jaundice. Bile-pigment he regards as physiologically an ultimate product of the decomposition of blood-pigment. He thinks that there is an excessive production of very highly pigmented bile in consequence of the nutritive changes previously mentioned, and that the jaundice results from the re-absorption of this. Icterus neonatorum, therefore, according to Dr. Hofmeier, depends essentially upon the state of nutrition during the first few days of life. It is a partly physiological, partly pathological phenomenon; and when it is observed to be intense and of long duration, it should be regarded as an indication of some radical fault in nutrition, and the especial attention and care of the medical man should be directed to the discovery and removal of that which is exerting an unfavourable influence.—*Med. Times and Gaz.*, Dec. 8, 1883.

Rupture of the Vermiform Process.

M. POLAILLON, Surgeon of the La Pitié, communicated to the Society of Medicine of Paris (*Union Méd.*, January 3), an interesting case of rupture of the ileo-cæcal appendix during an effort. A washerwoman, 19 years of age, and in the enjoyment of perfect health, while trying to lift a large bundle of linen, was seized with a sudden pain in the abdomen, accompanied by the sensation of something bursting. The pain kept increasing, together with great tenderness in the abdomen, especially in the right iliac fossa. Symptoms of intestinal obstruction appeared, and as no relief was obtained by the measures adopted, the patient was brought to La Pitié on the seventh day after the commencement of the symptoms. By this time her situation had become very desperate, and an incision was made in the left inguinal region, in order to search for the seat of obstruction. A discharge of fetid sero-purulent fluid announced that the intestine was already perforated, and that purulent peritonitis existed. Further exploration was not pursued, and an artificial anus was formed. The patient died ten hours after the operation, and abundant adhesions and suppura-

tion were found at the autopsy. The vermiform appendix, in an inflamed condition, was found adherent at the upper aperture of the pelvis, and near its free extremity was an oval ulceration, in the centre of which was a rounded perforation; and a little distance above the ulceration a raw bean was found obstructing the calibre of the appendix, but movable towards the cecum.

M. Polaillon observes that the case is remarkable as an instance of the rupture of the appendix by a mere effort, without any precursory signs, the subject being quite well at the time. Still, even in the absence of symptoms, it is evident that the foreign body had effected such a change on the coats of the appendix as to diminish their power of resistance and prepare the way for a rupture. The case also shows that peritonitis may give rise to the three symptoms, gaseous distension of the abdomen, fecal vomiting, and the absence of the emission of gas *per anum*, the union of which symptoms generally indicates intestinal obstruction. The error in diagnosis, however, is more apparent than real, for the adhesions arising from peritonitis may readily cause obstruction of the intestinal canal.—*Med. Times and Gazette*, Feb. 16, 1884.

The Forms of Purpura.

Dr. HENRI LOLOIR, in a recent paper on this subject, groups the pathogenic causes of purpura in the following manner:—

A. *Purpura from Modification of the Vessels*.—1. By disturbance of the capillary circulation, whatever may be the origin, causing active or passive hyperæmia, and producing, according to the case, hemorrhage by diapedesis or by rupture of the vessels. Nervous purpura should be included in this group. 2. Telangiectasic purpura, or the purpura of Cornil. While the pathogenesis of this form of purpura is not yet well determined, it nevertheless constitutes a special class by its pathological and clinical characters. In the case of Cornil and Frémont there was no extravasation of red globules, in spite of the existence of all the clinical characters of the petechiæ. 3. Purpura by primary alteration of the vascular walls, and consecutive rupture of these walls.

B. *Purpura by Modifications of the Blood*.—1. By too great fluidity of the blood. If the existence of this group was demonstrated there would be a purpura by diapedesis. 2. By vascular obstructions determined by certain elements contained in the blood, and causing the formation of thrombi or emboli. This purpura would be caused by simple diapedesis. It appears to be caused more often by vascular rupture; it is more often a hemorrhagic infarction of the integument. a. By formation of clots in cases of blood dyscrasia. b. By emboli formed of white blood globules (leucocythæmia, etc.). c. By emboli formed by bacteria or micrococci (septic affections, etc.). d. By emboli formed by altered blood globules.

C. *Nervous Purpura*.—It is very probable that cases are sometimes observed which cannot be placed in any of the above-mentioned groups of purpura. Very often the origin of purpura (leaving aside certain forms of nervous or embolic purpura) seems to be complex. In a number of cases a detailed examination of observed phenomena shows that different pathogenic causes coexist, and it should never be forgotten that the pathogenesis of a case of purpura may be complex.—*Annales de Dermat. et de Syphil.*, Jan. 1884.

Forms of Skin Diseases in Diabetics—Diabetic Dermatosis.

KAPOSI has recently published a paper on this subject, which was read before the Vienna Medical Society. He has lately observed a peculiar form of inflammatory gangrene of the skin, for which he proposes the name diabetic bulbo-

serpiginous gangrene. The case was that of a woman, æt. 51 years; early in May, 1882, a gangrenous inflammation appeared in several places on the left leg. This gradually became worse until January, 1883, when Kaposi saw her. There was an elongated gangrenous spot, of triangular form, on the left leg. A second gangrenous spot as large as a five-franc piece was situated below and posterior to the spine of the tibia. A third small spot was situated at the middle of the external border of the calf of the leg. On the anterior face of the leg, and somewhat surrounded by the gangrenous spots, were fifteen or twenty bullæ, whose size varied from that of a pea to that of a bean; they were oval or round, somewhat painful, and contained a muddy material. Some of them were broken, and below the skin was covered with a yellow eschar.

The three gangrenous points presented, then, the following common characteristics. The convex border was encircled by a corona of flabby bullæ, the contents of which were muddy-looking. In the first third there was dry softening, they were pulpy in the middle third, and in the third next to the convex border there were exuberant vegetations in process of cicatrization. The skin situated between the gangrenous spots and the bullæ was normal. There was no fever.

It is evident, then, that the gangrene caused certain isolated bullæ, and that its progress was caused by the production of bullæ, which process is opposed to separation, and it is equally evident that the character of the process is that of a bullo-serpiginous gangrene.

In this case the analysis of the urine showed 5.15 per cent. of sugar; there was no polyuria or polydipsia. Under the use of Carlsbad water the proportion of sugar fell to .6 per cent. Up to this time the gangrene had made considerable progress, but was finally arrested, and replaced by granulations and cicatrices. After an interval of about one month the state of the patient was worse; new gangrenous spots had appeared, always with the same characteristics. The patient then gradually grew worse and died about a month afterward.

Kaposi shows that, as far as gangrene is concerned, it gives origin to the bullæ, and he states that one of the characteristic signs of diabetic gangrene is the appearance, in disseminated spots and in certain regions, of cutaneous lesions of serpiginous course, with consecutive reparation and delimitation to the derma, the above described case being a striking example. At the same time Kaposi insists on the community of origin of all diabetic dermatoses, and claims that their common cause is the impregnation of the tissues with sugar. That the tissues are thus impregnated is beyond question. The excitation caused by this impregnation causes alteration of the sensitive nerves, which gives rise to pruritus; then alteration of the secretory and vaso-motor nerves, as a consequence of which anidrosis, urticaria, etc., are produced, and then, by direct irritation, inflammation of the vascular walls and other tissues. These last present but little tendency to inflammatory proliferation, but, on the contrary, a disposition to necrobiosis. It may be that a feeble, intermittent excretion of sugar, or a diabetes of long duration, may bring about, after a gradual tolerance of the tissues is established, a preponderating proliferation with but feeble destruction of tissue. If this be admitted, Kaposi feels authorized in adding a new variety to the forms of diabetic dermatosis, viz. diabetic papillomatosis. He has seen one case of this in a physician, æt. 60 years, of Rio de Janeiro, who has had diabetes for twenty years.—*Annales de Dermatol. et Syphil.*, Jan. 1884.

The Transmission of Syphilis.

At the close of a paper on this subject, Dr. M. KASSOWITZ draws the following conclusions:—

1. There are a large number of reported cases, in which women, who have never given any symptoms whatever of syphilis, bring children into the world

which, either at birth or soon after, show signs of infection. This shows the possibility and the reality of the transmission of this disease through the seminal fluid of a syphilitic father to the child.

2. Furthermore, there are a large number of observed cases of women who have borne syphilitic children to syphilitic fathers, and who have since remained uninfected through a number of years; and there are also women among these in whom the paternal transmission has died out. In these few cases the syphilitic contagium has not affected the mother.

3. Clinical observations and experimental inoculations show that such women appear less susceptible to syphilitic infection than other persons who are not placed in such a peculiar connection with a syphilitic organism. But a few cases of infection among such women have been observed.

4. The statements of certain authors as to the syphilitic diseases of mothers, of hereditary syphilitic children, without primary affection, sound as well in relation to the time of the appearance of the first symptoms as they are contrary to nature in the last, and can only be accepted as scientific in a few cases. Further and more exact observations are needed on this subject.

5. There are numerous authentic observations, that women, who are infected with general syphilis of a virulent form during pregnancy, have borne healthy children; and it is thus certain that in these cases the syphilitic poison has not passed the vaginal walls of the mother and the vascular system of the fœtus.

6. Clinical observations teach that these children enjoy a very certain immunity against syphilitic infection. Still there are a few cases of infection of these children during and after birth.

7. Again there are a few observations which show that an infection of the hitherto healthy fœtus (by generation) can take place from the infected mother. *Deutsche med. Wochens.*, Dec. 19, 1883.

Micro-Organisms from Cases of Purpura Hæmorrhagica.

At the meeting of the Pathological Society of London, of February 19th, Mr. WATSON CHEYNE showed micro-organisms from two cases of purpura hæmorrhagica. One case was that of a girl, æt. 12 years, who had a purpuric eruption with pain in the joints, epistaxis, and bleeding from the ear. The temperature was 104.6° on the morning of death. There were numerous ecchymoses in the skin, and hemorrhage into the pelvis of the right kidney. Sections of the heart showed extensive hemorrhage beneath the exocardium. The capillaries were plugged with small bacilli arranged in colonies; a few were isolated; the typical mode of grouping was evidently in colonies. The walls of the vessels were ruptured; there was no evidence of inflammation. The bacilli measured $\frac{7}{100}$ in. in length and $\frac{2}{100}$ in. in diameter. Spores or unstained roundish areas also existed in the rods. There was no peculiarity in the staining reactions. Methylene blue was the best dye. The distension of the wall of the capillaries seemed to show that the bacilli had been growing in the blood for some time. The probable cause of the hemorrhage was the plugging of the vessels with bacilli.

The other case was that of a boy, aged fourteen, who had one brother who bled much at the nose. The patient bled from a boil at first; afterwards there was constant bleeding from the gums, nose, and also into the conjunctiva. The temperature was 98°. After prolonged use of local styptics the bleeding ceased. The anæmia produced was intense, and the patient died. There was hemorrhage from an erosion of one small ulcer in the stomach. There were small sub-arachnoid hemorrhages. The testes, lungs, brain, skin, serous and mucous membranes were all affected. The lungs, tonsil, and heart were examined.

The pulmonary alveoli were full of blood, and the vessels contained colonies of micro-organisms; the capillaries and some larger vessels were completely blocked with swarms of streptococci, which exhibited a typical chain formation. These micrococci were $\frac{1}{1000}$ in. in diameter. There were no free micrococci. No inflammation and no necrotic layers were seen around the plugged vessels. Sections of the tonsils showed several of the vessels plugged with streptococci. The importance of the observation of two cases of idiopathic purpura hæmorrhagica associated with the presence of micro-organisms was very great. These micro-organisms formed colonies; other kinds did not form vascular plugs (except the typhoid bacillus). The question whether there was an entrance of specific germs from without or whether organisms had penetrated into the blood from the alimentary tract was considered.—*Lancet*, February 23, 1884.

SURGERY.

Antiseptic Surgery in its Applications to Field-Service.

At a meeting of the Woolwich Military Medical Society on February 15, 1884, Surgeon-Major C. H. GODWIN read a paper on this subject. In the discussion which followed, Sir JOSEPH LISTER, who was present, said that it is essential that all the surgeons concerned in the treatment of wounded men should be imbued with the idea of the importance of antiseptic principles. It is of no use for the surgeon who first treats a wounded man to act antiseptically, if the one who follows him does not do so; nor, conversely, is it of any use for the surgeon in the field-hospital to be ever so good an antiseptic surgeon, if his predecessor has defiled the wound. Then, again, as to the other point, in civil practice we may go to any amount of expense almost in our materials; we may have our materials as bulky as we please; but in military practice it is, I conceive, essential that the materials should be cheap, and that they should be, so far as the first treatment of the wounded man is concerned, capable of being employed in small bulk. Reyher divided his cases into the *befingerte* and the *unbefingerte*, cases which had been fingered by somebody before him, and cases which nobody before him had fingered. He said he happened to have had fourteen cases of gunshot-wound of the knee-joint; seven were fingered cases, and seven unfingered. The seven fingered cases had all died except one; he was still living, but he was in high fever, and Dr. Reyher was afraid he might succumb. Of the unfingered cases, all were alive, and only one had had fever, but Dr. Reyher said he had also had a considerable portion of his face shot away; this could not be treated antiseptically, and the fever was so explained, and he said, "Are these not remarkable results?" So much for Reyher and his principle that, as Surgeon-Major Godwin has said, what should be done in the first instance should be simply the covering up of the wound with some antiseptic material, and as little fingering as possible.

I should like to say a word or two with regard to simplifications of the treatment both in the field-hospital and at the front. First, as regards the field-hospital. Allusion has been made to the spray. I have long since held and taught that, of all the parts of the antiseptic system, the spray is the least important. It would not at all break my heart if I were told that I should never be allowed to use the spray again in my life; I am satisfied I could, by other means, get essentially the same results. Many German surgeons do not use the spray; therefore, the fact that the spray is an incumbrance is not, to my mind, an argument against the use of the antiseptic treatment by military surgeons. I

do not desire that the spray should be used in military practice. I believe essentially the same results can be got without it; and, if the military surgeon is to conceive that he cannot carry out antiseptic treatment except with the spray, I believe he will be very greatly embarrassed. The spray-apparatus is likely to get out of order; he will be constantly called upon to operate in circumstances where the spray is interfered with, by draughts of air, and so on, in tents; and it is much more important for him to confine his attention to other matters than the spray. If, when the operation has been done, he wash the wound well with some reliable antiseptic solution, the chances are immeasurably great that he will get as good results as if he used the spray. That is one point of simplification.

Then, as to an antiseptic lotion, you are aware, doubtless, that corrosive sublimate has been shown to have very wonderful antiseptic properties. Corrosive sublimate, at the same time, is an exceedingly cheap substance; it costs wholesale only about two shillings a pound, and an exceedingly small quantity is sufficient as an antiseptic lotion—one part to a thousand parts of water. This, it seems to me, is a very important matter. It is very much cheaper than such carbolic acid as is fitted for satisfactory use; I do not refer to the crude impure kinds, which are not satisfactory. Corrosive sublimate has been used in connection with what has been termed wood-wool, a curious term, no doubt—that is, a soft material, made by tearing up pine-wood into a sort of woolly substance. The corrosive sublimate in this wood-wool, the wood-wool itself being excessively cheap, is used in the proportion of a half per cent. of the weight of the wood-wool, with an equal part of glycerine. The objection to this wood-wool is its bulk; for, if it is to be used satisfactorily, the small proportion of the corrosive sublimate renders it necessary that it must be used in a large mass, otherwise the corrosive sublimate would be washed out prematurely by the discharges. I am at present engaged in some experiments with a view of seeing whether corrosive sublimate could not be used in a more manageable form; and I may mention here what I have never mentioned publicly before, which, as far as I know, is a new fact in chemistry—that corrosive sublimate turns out to be wonderfully soluble in glycerine. It is soluble in one and a half times its weight of glycerine in the cold. It takes sixteen parts of cold water to dissolve corrosive sublimate; it takes several parts of spirits of wine; but glycerine dissolves it with remarkable avidity; and I believe that here in fact will lie the key to the application of corrosive sublimate in a more compact form, and therefore more convenient for military service than the wood-wool. It is, perhaps, foolish of me to mention this, except that I wish to refer to that point of solubility in glycerine in another aspect directly; but meanwhile, if the wood-wool has been proved to be efficacious with the corrosive sublimate, there is this, I think, that may be borne in mind by military surgeons; that, if they have rags in abundance (rags are really the same thing as wood-wool—the same chemical substance, highly absorbent as the wood-wool is), rags answer in the same bulk as the wood-wool. If you have a mass of old sheeting or any sort of old rags at your disposal, if you dissolve corrosive sublimate with an equal part of glycerine in two hundred parts of water, steep the rags in this, and then hang them up to dry, you will have a dressing which can be certainly very easily prepared, and which, as the experience with wood-wool shows, I feel confident must prove efficacious if used in sufficient mass.

Then as to the dealing with the wounded in the first instance, I have already expressed my perfect concurrence with Dr. Reyher, that the less that is done in the way of handling the wound the better, because the surgeon must be under great difficulties dealing with a number of men together, and without his hospital appliances. Nevertheless, as has been stated, there are circumstances in which he must interfere; particularly in hemorrhage, when he must tie a bleeding vessel.

Now, as to the antiseptic solution which he should use, I believe he will find the solubility of corrosive sublimate in glycerine very valuable. Corrosive sublimate, as I have said, is soluble in one and a half parts of glycerine; one drachm then of this solution will prepare a watery solution of corrosive sublimate (1 to 1000) to the amount of one and a half pints, so that it will be in this way extremely portable. Corrosive sublimate is somewhat difficult to dissolve in water, except by aid of heat; but if you have it first dissolved in the glycerine, pour a little of this into water and diffuse it, you will have your antiseptic solution for washing sponges, the hands, and so forth, very easily prepared. I trust that the surgeon will always have an aseptic sponge; and this he can also do by means of corrosive sublimate more easily than with carbolic acid, simply from the fact that corrosive sublimate is not volatile. If sponges be purified with carbolic acid, and kept for a considerable time, the carbolic acid will leave them, and you cannot be sure that they are pure; but if you have them purified with the 1 to 1000 sublimate solution, you will be sure they are pure, whether they have been kept for a week or a year.

Then, as to the material with which the vessel should be tied, I cannot but think that it is an improvement that the catgut which we now use need not be kept in the bottles of oil in which old carbolized catgut used to be kept. It is kept in the dry state as easily as silk, and all that has to be done before using it is to put it in the antiseptic solution for a very few minutes.

As to the first dressing that should be used, it is certainly a very difficult matter to have some material that shall be portable, of small bulk, and at the same time shall give a fair promise of being effectual antiseptically. I am inclined to think, in the present state of our knowledge, that iodoform is the agent which promises best for this purpose. It is by no means the most powerful, but still it is a very excellent antiseptic. It does not seem to be able to destroy the poison of erysipelas as easily as carbolic acid, for example; and it certainly does not destroy various bacteria, as we have ascertained by experiment, nearly as well as carbolic acid, and some other of the more powerful antiseptics. Nevertheless, those who use iodoform, and I have used it a great deal myself, must confess it is really a very satisfactory agent as a dressing, used, for instance, in the form of iodoform-wool. It has this very great advantage, that, while it has this really valuable efficacy as an antiseptic, it is exceedingly little soluble in water or in the discharges that come from the wound, so that a very small quantity of it lasts a long time, while at the same time it is almost absolutely free from irritating properties. This is a very wonderful combination of advantages; and I am disposed to believe that dusting the wound over with the iodoform-powder, and then covering it over with some absorbent substance is, in the present state of our knowledge, the best thing that can be done for the wounded man in the first instance.

It so happens, only this very day I was reading an account, by Dr. Ladislav Lesser of Leipzig, on this very subject, and he proposes that antiseptic powder should be carried by the soldier in an empty cartridge. This, he considers, would contain a sufficient amount for the treatment of wounds. He says, as to the particular antiseptic, he does not wish to dogmatize upon that. He recommends two parts of boracic acid powder and one part of iodoform powder. I am inclined to think, myself, it would be more prudent to use the iodoform powder pure; because if the antiseptic is to be carried in small bulk, it should be very effective in proportion to its bulk, and the boracic acid is by no means so powerful for equal bulks as iodoform is. He recommends, then, that the soldier should have a cartridge full of this antiseptic powder; that he should have wrapped round this a bandage composed like these bandages which Mr. Stephenson has shown us this evening, corresponding a good deal to our antiseptic gauze, of open cotton

texture, impregnated with spermaceti, which may be a very good thing, as it will not stick to the wound as cotton-wool would. He recommends that round the cartridge containing the antiseptic powder should be wound this bandage, about four yards long, and round this again a piece of absorbent cotton-wool, which will go into very small bulk, and round this a three-cornered cotton handkerchief. Then he points out in what way these should be used. First of all the wound should be sprinkled with the powder, a few turns of the bandage put round, the absorbent cotton put over this, then the rest of the turns of bandage, and then the three-cornered handkerchief, used in the case of injuries to the arm, in the form of a sling. I am inclined to think that these suggestions of Dr. Lesser's are exceedingly good. I will only say that perhaps the little box containing the iodoform might be made with advantage in the form of a small dredging box, with small perforations in the lid covered with a cap. If there were a little space in the cartridge-box for this little dredger, then the other matters might, as Dr. Lesser says, instead of being packed round the box, be carried in the soldier's pocket, or, as was suggested, sewed in under his coat. If every soldier had material of this kind by him, it would certainly be a very important matter. A dressing of this kind would often answer the whole purpose. It might be left on in the case of smaller wounds till the healing was complete, or, at all events, for twenty-four or forty-eight hours, or even longer. It would be found, I believe, to keep the wound aseptic in the majority of cases.—*British Medical Journal*, February 23, 1884.

Operation on the Brain for the Relief of Left Hemiplegia.

At the meeting of the Pathological and Clinical Society of Glasgow, on January 21st, Dr. MACWEN showed a patient whose brain had been operated upon for the relief of left hemiplegia, and who has recovered the power of movement to such an extent as to enable her to walk freely about, though with a paraplegic gait; to raise her arm to the level of her shoulder, and to grasp with considerable power, though there is a deficiency in co-ordination of movement of the hand. She had a syphilitic history. The hemiplegia was preceded by a tingling sensation and a numbness of the left arm and leg, which increased until it ended (within six weeks from the commencement) in complete motor paralysis and a deficiency in the perception of touch. The left side of the face was also slightly affected. This was accompanied by mental confusion and loss of memory.

Full anti-syphilitic treatment had been tried along with counter-irritation to the head, previous to her coming into the Royal Infirmary, and while she was in the medical wards of that institution. These did not seem to have relieved in the slightest the condition spoken of above.

Trephining was performed over the middle of the ascending frontal and parietal convolutions. Internal table of the skull removed was found softened and thicker than usual, having on its internal surface a series of projections or roughnesses, some protruding for nearly one-eighth of an inch beyond the general level. A second opening was made over the occipital region, and a similar thickening of the internal table was found. Opposite to the first opening the dura mater was paler than normal, and somewhat thickened. It was elevated, and a false membrane of yellow colour, and about one-sixteenth of an inch in thickness, was removed. An incision was made into the brain in the direction of the paracentral lobule, when a gush of grumous red-coloured fluid escaped out of the opening. Its quantity was not measured, as it could not have been collected. Approximately, there would be about a couple of drachms. The brain pulsations previously were not discernible, but, after the escape of this collection of fluid, it

was thought that very feeble pulsations were seen. Some of the surgeons standing by doubted the presence of the cerebral pulsation. The disks of bone were carefully divided into segments and replanted, and are now quite firm. Wounds treated without pus production.

The day after the operation she expressed herself as very much better. On the third day she moved her toes. Within a week she lifted her leg from the bed and stated that she was so much better that she could turn in bed, and believed she could walk. The fingers were moved within a week. Her mind greatly changed for the better, her memory improving and her intelligence becoming much brighter. She can now walk freely about, and does a considerable amount of domestic duty in the ward. She lifts her arm to the level of her shoulders, and can grasp with considerable force.

Dr. FINLAYSON said that he had lately had the opportunity of seeing this case, at Dr. Macewen's request, in private, and he thought that there could be no possible doubt that the improvement which had taken place was due to the operation. It is known that in such cases as this, remarkable improvements do take place as the result of purely medical treatment, but in this case it is certain that the improvement was due to the operation. This method was quite a new one, and depended greatly upon the advances that had in recent years been made in cerebral localization. It was quite different, too, in its nature from operations on brains injured by violence. Although the case shown to-night was a very successful one, yet advance in such a procedure could scarcely be expected without a certain number of misfortunes.—*Glasgow Med. Journ.*, February, 1884.

Nephrectomy for Rupture of the Kidney.

Dr. HENRY G. RAWDON reports the case of a boy, æt. 12, who had fallen from a window, a distance of eight feet. Blood was passed in the urine and he complained of pain in the right side, which became more severe in a few days, and extended to the region of the bladder. Thirteen days after the injury the urine, which was very fetid, was drawn off, and the bladder washed out with a solution of permanganate of potash. On the next day the subcutaneous injection of ergotine was tried several times. The pain referred to the penis became more intense, and the tremors more marked and of longer duration. The catheter which was used for washing out the bladder was found blocked with broken-down clots.

He was now suffering from cystitis with irritative fever, caused by the decomposition of the blood clots, and aggravated by repeated attacks of retention.

Two days afterward the right kidney was removed by the lumbar incision. The kidney was found imbedded in a mass of old and recent clots, which pushed it considerably forward; it was also found to be almost divided into two equal portions by a transverse laceration from its outer border towards the hilus. Four days after the operation he became worse, gradually sank, and died on the forty-first day after the injury. A partial autopsy showed the following: A piece of the upper portion of the right kidney the size of a small walnut was found; it appeared healthy, as was also the corresponding ureter.

The left kidney was enlarged, and on section showed numerous points of supuration, and a small abscess was found under the capsule. Both the pelvis of the kidney and the ureter were considerably dilated, and filled with pus; the lining membrane was rough and covered with phosphatic granules.

The bladder was contracted, its mucous membrane was raw-looking and thickened, and coated with phosphates. At the fundus of the viscus, and adherent to it, was a solidified and partially organized mass full of phosphatic deposit—not improbably the remains of old blood-clots.

The peritoneum and the other abdominal viscera were healthy.

Death appears to have been due to the mischief in the left kidney. The putrefaction of blood-clots in the bladder, together with the frequent attacks of retention, caused inflammation, which had extended to the kidney along the ureter. The earlier performance of cystotomy might have averted some of these consequences.

The chief features of the case may be briefly summarized, namely, nephrectomy was performed on the seventeenth day, cystotomy on the twenty-first day, and death took place on the forty-first day after the injury to the kidney.

The patient lived twenty-four days after nephrectomy had been performed.—*Liverpool Medico-Chir. Journ.*, Jan. 1884.

Congenital Hydrocele, Treated by Ligature of the Neck of the Sac.

Mr. F. A. SOUTHAM reports the case of a youth, æt. 18 years, who had a congenital hydrocele of the tunica vaginalis of the right side. He was ordered to wear a truss day and night, in hopes that the canal between the peritoneal cavity and the tunica vaginalis might be obliterated by the pressure. This treatment was continued for three months, but without any appreciable result.

It was then determined to perform a radical cure by ligaturing the neck of the sac, as in the plan often adopted in the radical cure of hernia. An incision an inch and a half in length was made in the direction of the cord, commencing above directly over the external ring. The cord having been exposed for the same distance, the neck of the sac, which was about the size of a goose-quill, was carefully dissected from it, and then ligatured with strong catgut in two places, namely, just below the external ring and at another point about one inch lower down, care being taken not to include the cord in the ligatures. The neck of the sac was then divided between these two points, and the external wound closed, a small drainage-tube being left in the lower part of the incision. The operation was performed under the carbolic spray, and the wound dressed according to the Listerian method. The wound was completely healed on the seventh day, and the patient left the hospital nine days later, there still being slight swelling of the scrotum, owing to the presence of a little fluid in the tunica vaginalis; but in the course of a few weeks this gradually disappeared, on painting the skin with tincture of iodine, and keeping the parts well raised in a suspensory bandage. When the patient was last seen, about six months after the operation, all trace of the hydrocele had quite disappeared.

Congenital hydrocele, though not uncommon in infants and young children, usually disappears as the child grows older, especially if a truss be constantly worn, the irritation produced by the pad setting up slight inflammation in the neck of the sac, which, as a consequence, becomes obliterated. The fluid present in the tunica vaginalis, if absorption do not take place naturally, can then be readily removed by tapping, or it gradually disappears on the application of some slight irritant over the scrotum; and, as a rule, no further reaccumulation takes place. The affection is consequently of somewhat rare occurrence in adults; and the treatment by the method of radical cure employed in this instance should, as a rule, be reserved for the cases in which obliteration of the canal of communication cannot be obtained by simpler means. So long as the neck of the sac is patent, an open canal is present, along which a hernia may at any time descend—a result which it is, of course, very desirable, if possible, to avoid. The operation was, therefore, undertaken in the present case, not only with the object of curing the hydrocele, but also with a view to prevent the formation of a hernia taking place.—*British Medical Journal*, Jan. 26, 1884.

Excision of Syphilitic and Soft Chancres.

In the *Vratch*, 1882, No. 33, Dr. V. M. ZAKHAREVITCH, on the ground of fifteen cases operated on by him during three years, ardently advocates excision both of syphilitic and of soft chancres, and lays down the following rules: 1. Syphilitic chancre must be excised in all cases where its situation permits the fullest possible operation, and when the swelling of the lymphatic glands is not older than two days. 2. Similarly, soft chancres must be excised in all cases where the operation is permitted by their situation. The advantages of excision of soft chancres, as enumerated by the author, are these. *a.* In some cases, excision, with subsequent suturing, leads to healing by the first intention, and thus shortens the period of healing of a chancreous ulcer to the extent of a few days. *b.* It shortens the process of healing to a half or a third of the usual time, even in cases where the operation has not been followed by the application of sutures. *c.* It removes all question of mistakes in diagnosis, with their consequences (the author finds that hard chancre in its initial stage is frequently mistaken for a soft ulcer, in consequence of which the excision is practised only too late). 3. When there exists the slightest suspicion of the real character of a chancroid ulcer, excision must not be followed by the use of caustics or the application of sutures; otherwise, if the induration of the wound appear, it may come to observation only too late for treatment (that is, for repeated excision). 4. Excision must be performed under the permanent irrigation of the field of operation, while the operator must most strictly avoid touching the wound with the fingers or with instruments bearing any traces of chancreous fluid.—*London Med. Record*, Feb. 1884.

Infective Osteo-Myelitis.

One of the latest researches undertaken in Dr. KOCH's laboratory at the Imperial Board of Health, Berlin, has been directed to the part played by micro-organisms in acute osteo-myelitis; and a preliminary report, issued by the observer, Dr. Struck, appears in a recent number of the *Deutsche medizinische Wochenschrift*. The inquiry was undertaken with the view of confirming the statements of Professors Schuller, Rosenbach, and others as to the presence of micro-organisms in this disease, and also by means of culture experiments to isolate these bacteria and reproduce the disease by inoculation in animals. It is needless to say that the research was conducted with the greatest care to prevent external contamination, and that it followed strictly the lines which have yielded so much fruit in similar investigations upon other diseases. The material employed in the first instance was the pus obtained, under strict and antiseptic precautions, from osteo-myelitic abscesses in five cases. The pus was collected in pure, sterilized vessels, which were then carefully closed; it was yellowish in colour, and had an odour resembling that of yeast. Drops of this pus, collected and dried on cover-glasses, and stained with methyl blue and fuchsin, revealed the presence of large numbers of micrococci, corresponding to those already photographed by Dr. Koch in similar cases. The "potato culture" of this pus resulted in the development, on the surface of the portion of boiled potato employed, of an orange-coloured layer, which appeared at the end of twenty-four hours after exposure to a temperature of 30° C., becoming more developed in a few days. Microscopical examination of this material showed it to be composed of masses of micrococci corresponding in size to those found in the pus. Cultures were also made in blood-serum and gelatine, and in each case with a like result, the development of the organism producing first a turbidity and then a distinctly orange-coloured deposit at the points at which the pus had been introduced into

these media; the gelatine became fluid as the growth proceeded. The products of these several cultures were then inoculated on mice, guinea-pigs, and rabbits, by subcutaneous injection. No result followed, either locally at the site of inoculation or generally; it was inferred that, introduced in this way, the micro-organism could not develop pathogenic properties. Rather larger quantities (from 0.2 to 1 cubic centimetre) were injected into the abdominal cavity, which resulted in the setting up of peritonitis, but without any signs of lesion of the bones. Similarly, injections into large veins were without effect when small quantities were used, and only produced toxic results (but not osteo-mylitis) when the material was employed in greater amount. These negative results therefore suggested that the conditions were not parallel to those obtaining in man, and that some traumatic lesion of the osseous system was essential for the production of osteo-mylitis when the virus was introduced into the circulation; and this proved to be the case. The experiment was varied by inflicting on the animal, a few days before the inoculation was practised, an injury sufficient to crush or fracture a bone of one of the limbs. Of fifteen rabbits so dealt with, only four showed no effects after injection into the blood of from 0.5 to 1 cubic centimetre of the material. In each of the others the animal became dull the day after the inoculation and refused food, and in the course of some days the injured limb became very swollen and tender, with formation of abscess, death resulting in twelve or fourteen days. In each instance a large quantity of the characteristic pus was seen around the injured bone and within its medullary cavity; and in three cases small metastatic foci occurred in the lungs and kidneys. The pus in all these parts abounded with micrococci; the blood also contained them. One rabbit had pericarditis.

These experiments appear to be conclusive, and they point to the rather instructive fact that, in order to produce osteo-mylitis of this acute infective type, not only must there be a specific virus in the system, but there must also be a local inflammatory process, or, if it be preferred, a local injury to the tissue, which becomes the seat of infective inflammation in the presence of the prime factor—the virus in the blood. How far this may be in accord with clinical experience we will not now venture to inquire; but it is worth remembering that cases of osteo-mylitis and acute necrosis are mostly met with in subjects in whom the general health is already impaired, and where a comparatively slight injury may evoke this severe local inflammation.—*Lancet*, Dec. 8, 1883.

The Direct Treatment of Spinal Caries by Operation.

At the meeting of the Royal Medical and Chirurgical Society, on Jan. 8th, Mr. FREDERICK TREVES read a paper on this subject.

He said that the gravity of spinal caries depends not so much upon any single pathological feature in the process as upon the depth at which the disease was situated, and its inaccessibility to the usual operative procedures applied to caries elsewhere. Diseased bone could not be removed from the vertebral bodies, and the morbid products, having to travel a great distance in order to be evacuated, were apt to induce immense purulent collections. These collections were usually opened at a point remote from the original seat of the disease. In the operation proposed by the author, the anterior surfaces of the bodies of all the lumbar vertebræ, and—with some reservation—of the last dorsal vertebra, could be reached from the loin. A vertical incision was made near the outer edge of the erector spinæ; the sheath of that muscle and the quadratus lumborum were cut through; the psoas muscle was incised, and the vertebræ reached by continuing the operation along the deep aspect of that structure. The details of the procedure were

fully described. By means of this operation the vertebræ could be readily examined, carious or necrosed bone could be removed, and a ready and direct exit could be given to all morbid products; an abscess situated in the psoas muscle or in the lumbar region could be evacuated while it was yet small, and before it had led to a large abscess-cavity. If a large psoas or lumbar abscess existed, it could be evacuated at its point of origin, and at a spot that, in the recumbent posture, corresponded to its most dependent part. If Hueter's statement were true, that the two vertebræ most frequently attacked by caries were the last dorsal and first lumbar, the operation should be capable of frequent application. The author detailed three cases in which he performed this operation. All the patients made a good recovery. In one of the instances he evacuated at its point of origin a psoas abscess containing forty ounces of pus, and removed from the body of the first lumbar vertebra a large sequestrum measuring one inch by half an inch. The immediate improvement in this patient's condition was very marked. In another case, the psoas abscesses had been opened in the thigh some months previously. By this operation a counter-opening was made at the point of origin of the abscess from the lumbar spine, and the entire abscess-cavity was drained by a large tube passing from the origin of the psoas muscle to its insertion.

Mr. BRYANT thought that it could hardly be said fairly that more than a small proportion of the cases of psoas abscess would be wisely treated as Mr. Treves had suggested. There were some to which it would be particularly applicable, viz., those abscesses which originated in the psoas muscle without any connection with the spine—arising from a strain, or sprain, or rupture—and which spread up sometimes so as to affect the spinal column secondarily, so that it became superficially diseased by contact with pus. If free and convenient exit for the pus were afforded, such cases might heal by granulation. The drainage-tube which Mr. Treves had used, and which was about half an inch in internal diameter, seemed to him probably unnecessarily large; such a matter, however, could only be determined by experience. Treatment of this sort was not entirely new; he had himself treated five or six cases by drainage above the ileum; in two, he had taken away small portions of bone from the ileum, which had become diseased, probably from pus, and he had long been looking for cases where such treatment might be more freely used.

Mr. NOBLE SMITH thought that no operation should be performed except when there was no improvement for a long time and some source of irritation, and that incision should not be made early. The chief cause of death in these cases of psoas abscess arising from spiral caries was, he thought, the imperfection of the attempts made to fix the spine. He had himself effected complete mechanical fixation of the spine in twenty-five cases, and in all those cases there had been cure or progressive recovery. The details of fifteen of them had been published, and he hoped to publish the rest.

Mr. SAVORY said that he would first object that by no reasonable operation could a sufficient area be exposed for the removal of bone. Still, he had no practical experience of Mr. Treves's operation, and could only adduce a kindred operation which he had seen performed for the replacement of the parts of a fractured spine. In that case, the danger of the operation had impressed him very strongly; the risk from hemorrhage or injury to the spinal cord was very great. It might justly be objected that the tissues of a chronic invalid were very different from those of a healthy man after a sudden accident; but still he was inclined to regard Mr. Treves's method of treatment as almost entirely impracticable. If comparison were made with a very much easier set of cases—diseases of the tarsus—it would be universally recognized that even there it was not easy to say in an operation what was being removed; and how thankful the operator was for the

sue of an Esmarch's bandage, which made exploration comparatively easy! But in any operation on the bodies of spinal vertebræ—where the hemorrhage was likely to be profuse, and where touch probably was the only guide—he could hardly help thinking that the conditions rendered it unjustifiable. And the second objection he felt strongly also—viz., that, unless these operations were done at the right time, they would do more harm than good. Caries was not a disease in itself; it was the result of a previous inflammation, the area of which extended far beyond the caries. Operations whilst the disease was advancing were likely to extend the inflammation and to extend the caries, its sequela. If we could hit on the time, as Mr. Treves had done in his first case, when there was a sequestrum, the operation would be of the greatest profit, for it would be a possible way of getting rid of a hopeless obstacle that could not be got rid of in any other way. But, unfortunately, there were no means that he knew of for the diagnosis of sequestra. It might be answered, then we should explore. But should we be justified in using such severe measures for what might very possibly indeed be a case that might be cured by many natural causes? To act after such a plan would suggest an operative mania.

Mr. TREVES, in replying, said that the object of his paper had been mainly anatomical, viz., to show the best route by which to reach the spine and to open a psoas abscess. The sequestrum which he had met with in his first case had not been diagnosed beforehand, and was a rare accident. To attempt to scoop out carious bone he agreed was out of the question. He was inclined to agree with Mr. Bryant, inasmuch as he thought he had found the bone bared by the neighbourhood of previous pus. The evacuation of the pus was then much to be desired. The very large drainage-tube he had only adopted after trials of smaller ones, and he had found it answer well. Against the method of mechanically fixing the spine, as advocated by Mr. Forneaux Jordan and Mr. Noble Smith, he felt bound to protest strongly, for it led to the most unfortunate results in lay opinion. If the spine were said to be affected it was very commonly the first idea that “an apparatus” must be got, and there all attempt at treatment was apt to end. He did not agree with Mr. Parker that it was better to open the abscess above Poupart's ligament than below, for he had found it more difficult and less effective as a drain. He quite agreed with Mr. Savory that in healthy subjects no room for operation could be obtained, but in the diseased cases the vertebræ had been largely exposed by the abscess, otherwise the operation would be nothing less than barbarous.—*British Medical Journ.*, Jan. 12, 1884.

Removal of Right Arm, Scapula, and Half of the Clavicle.

At the meeting of the Medico-Chirurgical Society of Edinburgh on January 16th, Dr. MacGillivray exhibited for Dr. HERON WATSON, the right arm, scapula, and half of the clavicle of a gentleman about 50 years of age, removed on account of an enormous enchondroma involving the upper part of the arm and shoulder. The patient had suffered from similar tumours of both hands for many years, and at one time the middle finger of the right hand had been amputated by the late Professor Syme on account of its inconvenient curled-up position in the palm. The other fingers of both hands were also affected, but caused little inconvenience. After the operation he went to India, where he carried on his usual avocations, and was able to write, ride, and play lawn tennis until quite lately. Eighteen months ago he noticed a slight swelling in the upper part of the arm, and this had steadily gone on increasing. The elbow-joint also became preternaturally mobile, and was deformed by several nodular masses. He, however, allowed the tumour of the shoulder to increase to an immense size, until,

indeed, the arm became practically useless, and the pressure on the axillary plexus occasioned great pain. He then came home, and was seen by Dr. Heron Watson, who recommended the entire removal of the affected parts. The arm, scapula, and the outer half of the clavicle were accordingly amputated about three weeks ago. The patient never had a bad symptom. The dressing was not changed for a week, when all except the opening for the drainage-tube was found to have healed by first intention, and the patient was now perfectly well.—*Edin. Med. Journ.*, February, 1884.

Flat-foot, and its Cure by Operation.

At the meeting of the Medical Society of London, on January 14th, Dr. ALEXANDER OGSTON (Aberdeen) read a paper, in which, after emphasizing the fruitfulness of the ordinary and usual methods of treatment, he entered into a discussion of the causes of flat-foot, and the mechanism of its production. The appearances observed in it were held to be due to a falling down of the inner side of the plantar arch, and this was mainly owing to a yielding of the astragalo-scapoid joint in the sense of dorsal flexion. The deformity, in his experience, generally occurred in connection with rachitis adolescentium. Of this, evidence was found in rickety knottings of the bones, and other symptoms of rickets; as a rule, there had also been an amount of labour beyond the strength; in one boy, however, who was very fat, the flat-foot appeared at 8, without any other apparent cause. *Pes valgus* was a misleading term; the valgus was not a necessary part of the deformity. Valgus-ankle also was a different deformity; it was seen in young girls, and caused so much displacement at the ankle-joint that the malleoli struck each other in walking. In true flat-foot, on the other hand, the ankle-joint did not participate, but the arch of the foot became unfolded so as to touch the ground along the whole inner border. Examination of a foot in this condition might show relaxation of all joints, but especially, and in great degree, in the astragalo-scapoid joint. When deformity existed to only a slight degree, it might disappear at once on lifting the foot from the ground. A slight aching pain was complained of; and in such cases an error of diagnosis was very liable to occur, owing to the condition of flat-foot only being present when the foot was on the ground being overlooked. In process of time, the deformity became permanent, and no longer disappeared when the weight of the body was taken off. Alteration in the shape of the bones finally occurred, so that, even by the use of force, the arch of the foot could not be restored. The relaxation of the astragalo-scapoid joint and the alteration in the bones were, he considered, the key to the deformity. As a secondary event, deformity of the great toe occurred, and, in extreme cases, the form of the foot was so altered as to become "canoe-shaped," the calcaneum being so displaced, the posterior part being tilted upwards, that the heel could not be brought to the ground. The cure was arrived at by causing anchylosis at the astragalo-scapoid joint after it had been restored to position. Several methods, having this object in view, had been tried, but the best results had been obtained by the following operation: An incision was made on the inner border of the foot, parallel to the sole and over the joint; the joint was freely opened; the surfaces of the scaphoid and astragalus were denuded of their articular cartilage; the arch of the foot was restored to position, and the joint fixed by ivory pegs passing through the two bones. In some cases the patients had been able to walk in two months, but as bony union occurred slowly in persons liable to flat-foot, he considered three months' rest in stiff bandages necessary to insure bony anchylosis after the operation. In one patient only a little tenderness remained for some time, and, five months after the operation, one of the ivory pegs was extruded through a small painless sinus. The opera-

tion proved successful in seventeen cases performed on ten patients. The plantar was not generally completely cured, but all the patients, with the exception of the men in whom the peg was extruded, considered themselves, when seen at considerable intervals after operation, cured. He observed the strictest antiseptic precautions (Listerian).

Mr. BRYANT thought that the operation was a valuable one to be applied to suitable, that is, severe cases. A very similar operation had been performed by Mr. Golding Bird.

Mr. DAVY did not feel convinced of the utility of the operation recommended by Professor Ogston. He looked with disfavour on any operation which tended to diminish the elasticity of the inner three-fifths of the foot, and felt sceptical as to the permanent benefit likely to be derived from it.

The PRESIDENT thought the operation promised to give great relief in some cases. He inquired whether anything could be done to remedy and prevent the aggravation of flat-foot in young children before structural changes had taken place.

Dr. OGSTON said that in none of the cases had contraction of the tendons been a prominent symptom. He had no experience of the operation in very severe aggravated cases, where the deformity amounted to the canoe-shaped foot. With regard to the question as to what became of the ivory pegs, he observed that Reidinger and Trendelenburg had shown that ivory pegs might become eroded and vascularized, but the occurrence had never come under his observation. His operation had been performed on "adolescents" between the age of thirteen and seventeen, or a little older. He had never, in any of his cases, met with a rise of temperature above 100° Fahr., or any symptoms of fever.—*British Med. Journ.*, January 19, 1884.

Ligation of Carotid and Subclavian for Innominate Aneurism.

Dr. CAMERON showed, at the meeting of the Pathological and Clinical Society of Glasgow on November 13th, a patient upon whom this operation had been performed. She was a widow, aged 57, who consulted him on account of a pulsating tumour just above the right sterno-clavicular articulation. She first became aware of its presence about four years ago, but had paid little attention to it until lately, when she was informed of its serious character. The tumour, which was clearly aneurismal, extended for some little distance into the neck, and reached outwards in the form of a pointed and prominent prolongation of the main swelling to beyond the outer border of the sterno-mastoid muscle.

On 24th March, he ligatured the right subclavian and carotid arteries with antiseptic catgut. It had been prepared by immersion in a one per cent. solution of chromic acid for twelve hours, and afterwards for twelve hours in the solution of sulphurous acid of the British Pharmacopœia. He placed both ligatures in watery solution of carbolic acid (1 to 20) for about half an hour before using them. That used for tying the subclavian was rather thicker than that with which the carotid was tied.

The carotid was tied immediately below the omohyoid muscle. Drainage-tubes were as usual placed in both wounds. The immediate effect of the operation on the tumour could hardly be well estimated, as the patient continued under chloroform until some time after the neck was enveloped in the dressings, pale and faint, and with a feeble action of the heart.

The stitches were removed on April 5th; on April 12th the incisions were all healed. The defined tumour, described as existing behind the sterno-mastoid muscle, cannot be recognized; but there is marked pulsation in this situation,

which extends towards the sternal notch in a very pronounced manner, and is associated with much heaving there. Indeed, the heaving pulsation at this point seems to me to be more marked than before the operation, although the whole pulsating area is, no doubt, less. The dulness on percussion in the upper part of the chest, the deepened second sound, and the sense of shock on application of the hand still continue very distinct; but there is no heaving impulse to be detected there and no murmur. The radial and temporal arteries do not pulsate on the right side.

At present the patient remains very well, and in much the same state as regards the aneurism as after the operation twenty months ago.—*Glasgow Med. Journ.*, Dec. 1883.

Aneurism of the Aortic Arch after Ligature of the Carotid and Subclavian Arteries.

At the Liverpool Medical Institution, on January 11, 1884, Dr. ALEXANDER reported the case of a woman, æt. 48, suffering from an aneurism of the innominate artery or of the aortic arch at the root of the innominate.

Dr. Robertson had tried various remedies, and as these failed, and as the tumour was increasing, he sent her to the surgical wards to have the distal ligature of carotid and subclavian arteries performed.

This was done, and the wounds healed without any trouble. Some relief was obtained, the tumour subsided, and its pulsation was less forcible, but the amount of relief was disappointing.

She died six months afterward, from increasing dyspnoea and orthopnoea, and this interesting specimen was obtained. It was seen that the supposed aneurism was merely an enormously dilated aortic arch and innominate artery, without a particle of consolidated lymph in their interior. The inner coats of the dilated vessels were very atheromatous. This condition of affairs accounts for the softness and compressibility of the aneurismal tumour during life, which could be completely obliterated by the fingers as long as the patient could bear the pressure, which was not long. The heart was enormously enlarged, and through the enlargement the aortic arch was pushed up to a higher level in the neck than usual. The subclavian artery was blocked up from its origin down to the collateral branches, but the carotid artery was quite pervious in all its extent. At the spot where the catgut ligature had been applied a white, apparently atheromatous, streak surrounded the vessel. The ligatures used were the ordinary ligatures of the Glasgow Apothecaries' Hall, of the strongest kind. The carotid ligature had yielded too soon, and the clot had dissolved or had been safely deposited in some non-vital spot where it could be found.—*Liverpool Medico-Chir. Journ.*, January, 1884.

Gangrene after Subcutaneous Arterial Injury.

Dr. WEITZ reports the case of a young man, æt. 26 years, who came under his care in February, 1883. He had been caught by a falling tree, and had received an injury of the thigh. Soon after the injury the thigh became greatly swollen, and very painful. A few hours later he was seen by Dr. Lahusen, who found the thigh and leg swollen, and anæsthesia of the lower third of the leg and foot. There was no fracture. Weitz saw him five days later, and found the whole lower extremity swollen, and a hard cord-like body just below Poupart's ligament, which he diagnosticated as the iliac vein containing a thrombus. The great toe was coloured blue-black. The lower third of the leg and the foot were still anæsthetic, and the whole extremity was now extremely painful. The pulse of the patient was 104, and his appearance anæmic. The gangrene now spread

from the toes to the foot and leg, and it was evident that amputation was indicated. Weitz wished to amputate through the leg, but found an abscess in the tibialis anticus muscle, and therefore performed the operation at the middle of the thigh. Between the quadriceps extensor and the adductor muscles was found a mass of coagulated blood. There was but very little hemorrhage from the wound, only two or three vessels bleeding, and these not so large as a digital artery.

Examination of the amputated limb showed that the muscular structures were infiltrated with pus, even the muscles on the anterior aspect of the thigh being affected to a slight extent. Both the femoral artery and vein were strongly retracted, the artery more than the vein. The ends lay in a mass of coagulated blood in the popliteal space, the vein being filled with coagulated blood. The artery was empty, and nowhere atheromatous. The patient recovered without bad symptoms. Weitz has not been able to find any similar case recorded in literature.—*Berlin klin. Wochens.*, February 18, 1884.

OPHTHALMOLOGY AND OTOTOLOGY.

Jequirity in the Treatment of Granular Lids.

In summing up his experience gathered from the study of sixty-five eyes treated with jequirity from July to November, 1883, Dr. F. C. HATZ draws the following conclusions:—

1. Jequirity is the best known remedy for the chronic granular conjunctivitis.
2. It is the most effective remedy for the clearing of trachomatous pannus, and in inveterate forms of pannus it is preferable to peritomy, as well as to the inoculation of blennorrhœal virus, because it does its work quicker than the operation, and safer than the inoculation.
3. It has no injurious effect upon the eye, and can be used with perfect safety, even when the cornea is ulcerated.
4. But it should not be used while the cornea and conjunctiva are acutely inflamed.
5. It does not benefit those cases of chronic conjunctivitis in which the symptoms of catarrh (increased secretion, succulence of the retro-tarsal folds, etc.) predominate over those of trachoma (enlarged papillæ, and lymph follicles, plastic infiltration of tarsal conjunctiva).
6. The most violent attacks of jequirity ophthalmia accomplish the speediest cures of granulated eyelids and the quickest clearing up of the vascular cornea. *Chicago Med. Journ. and Examiner*, Feb. 1884.

Hotz's Operation for Entropion.

Four years ago, in the 9th vol. of the *Archiv für Augenheilkunde*, Hotz described a new operation which he had found successful for the treatment of entropion. In the last vol. (13th) of the same *Archiv* he has again occasion to recommend that method, which he has employed in 177 cases. The operation consists in making a cut through the skin on a level with the upper border of the tarsal cartilage of the upper lid (lower border of tarsus of lower lid), excising the layer of muscular fibres overlying the cartilage to the breadth of 3-4 mm., and then stitching the borders of the skin-wound to the edge of the cartilage. The two points to be attended to in order to secure success by this method are—

1st. The position of the section in the skin, which must be on a level with the upper border of the cartilage throughout; and 2d. The proper position of the sutures, which must firmly include the *upper edge* of the tarsus. Hotz claims the following advantages for this procedure: 1. That it attains the aim in view without the least shortening of the skin of the lid. 2. That on this account it may be employed in cases in which, owing to the shortening produced by previous operations, other methods are not available. 3. That it in no way interferes with the conformation or function of the lid. 4. That the stretching of the skin, which restores the margin of the lid to its proper position, is the same whether the lid be raised or depressed, which is not the case when a piece of skin is excised.—*Edinb. Med. Journ.*, Dec. 1883.

A Hitherto Undescribed Appearance of the Retina, or "Shot-silk Retina."

In a paper on this subject, read at the last annual meeting of the British Medical Association, Mr. W. SPENCER WATSON described an appearance which he has noticed in about a dozen cases, and which, for convenience, he calls "shot-silk" retina. Most of us, he says, have noticed the lens in advanced chronic glaucoma apparently opaque when reviewed by reflected light, but perfectly transparent when examined ophthalmoscopically, *i. e.*, by transmitted light.

It is, he thinks, possible that some similar change in the retina is the cause of the "shot-silk" appearance. Whether this be a degenerative change, or (as he is at present more inclined to think) a persistent fœtal condition, he does not venture, at present, to give an opinion. Any reflected light sent to the observer's eye from the retinal elements must be the result of opacity or opalescence of those elements. The latter seems to him to be the condition present in the "shot-silk" retina; its change of position with the varying movements of the eye being analogous to that observed in some kinds of opalescent glass.

Data are wanting to enable us to decide as to the exact pathological significance of this opalescence of the retina (if such it be), but from its frequency in young children, in whom it is associated with strabismus and hebetudo visûs, he is inclined to regard it as a congenital defect. He has seen it, however, in one case without any great amount of defective vision. The refraction in all the cases he has seen is hypermetropic.

As an alternative explanation, it is possible that the opalescence has its seat in the hyaloid membrane, and there is certainly one point in favour of this supposition. The persistent hyaline canal (a very rare condition) has a somewhat similar opalescent look; but, in this case, he thinks that the flickering and changing aspect of the opacity are due rather to its being viewed successively at different depths in the vitreous chamber—a condition which would not obtain in regard to the "shot-silk" flickering lines on the retinal surface.

It is possible, as a third alternative explanation, that similar appearances might result from the suspension in the vitreous of delicate filaments or membranes, more or less parallel with the plane of the retina, and reflecting the light variously, as the angle, under which the fundus was viewed, varied.

Of these three explanations, he prefers the one first stated—viz., that the retina is opalescent, and that this is a persistent fœtal condition.

He does not remember to have seen appearances similar to those described in adults; but this may be due to the fact that he has more frequently examined children ophthalmoscopically, when testing them previously to operating for strabismus. He suspects, however, that, had he more frequently examined adults affected with high degrees of hypermetropia, similar appearances would have presented themselves.—*British Med. Journ.*, Jan. 12, 1884.

MIDWIFERY AND GYNÆCOLOGY.

Antiseptic Midwifery.

Dr. G. EUSTACHE, of Lille, in a general review of obstetrics, asks concerning the means for preventing puerperal sepsis:—

1. *How shall puerperal infection by the accoucheur be prevented?* The physician is only too often the vehicle of infection. He is called to see a case of puerperal fever, to make an autopsy, etc., in the exercise of his profession. Under these circumstances should he, in order to keep from infecting other patients, abstain from practice for a certain length of time? And for how long a time? or may he not render himself non-infecting by the proper use of antiseptics?

These questions have been fully discussed in Germany during the past six months. Professor Swiecikie, of Erlangen, in a paper read before the Obstetrical Society of Berlin, expresses the opinion that, after attending a case of puerperal fever, the physician should not attend another labour case within a week at the least. However prudent this suggestion is, it would be extremely difficult to comply with it. Löhlein, on the contrary, states that it is not necessary to refrain from practice at all, if proper antiseptic precautions be taken, and Fritsch and Wiener, of Breslau, have taken the same ground. At the same time Eustache believes that the handling of a puerperal woman by one who is engaged in dissecting is very unwise, and should not be countenanced.

2. *What is the best antiseptic for the accoucheur?* The antizymotic and disinfectant properties of corrosive sublimate have been known for some time, but only within a comparatively short time has it come into use as an antiseptic. It is now believed, in Germany, to be the antiseptic agent, *par excellence*, for obstetrical practice. Various solutions have been recommended. Some use a solution of 1 to 1000, but the greater number seem inclined to use weaker solutions, say, 1 to 1500, 2000, or 2500.—*Archives de Toxicologie*, Feb. 1884.

Vaginal Cysts.

Dr. MAX GRAEFE, of Berlin, contributes to a recent number of the *Zeitschr. f. Geburt. u. Gynäk.* a short but interesting paper on vaginal cysts. He believes that these are less uncommon than is generally supposed, because they generally cause no suffering, and therefore are probably often unnoticed. He gives an account of ten cases under his own observation (occurring in Professor Schröder's clinic), in each of which a careful microscopical examination of the cyst wall was made. Adding to these cases published by Winkel, Klebs, and other writers, our author arrives at the following conclusions: Out of 61 cases, in 29 the cyst was on the anterior vaginal wall, in 21 on the posterior, and in 11 laterally situated. He points out that this statement must be taken with the qualification that in many cases the cyst is not seated exclusively upon either vaginal wall. The colour, consistence, and morphological elements of the cyst contents differ widely even in cysts apparently similar in structure. The thickness of the cyst wall varies from a millimetre to a centimetre. It is composed of connective tissue, with, in thick-walled cysts, smooth muscular fibres, that is, the structure of the vagina. Outside it is covered with pavement epithelium, like that of the vagina. Internally most cysts are lined with cylindrical epithelium, but now and again we find a single or several layers of pavement epithelium. There may be in the same cyst cylindrical epithelium at one part and pavement at another, as shown by Lebedeff, and in three of Dr. Graefe's cases. After describing their anatomy, our author discusses the different opinions that have

been entertained as to their origin. Klebs looks upon them as dilated lymphatic vessels, for the reason that he has found them lined with lymphatic endothelium. Dr. Graefe has only been able to find records of three cases in which the interior had such a covering; and even in them he does not think that the inference follows, that the cyst must have arisen by dilatation of a lymphatic vessel, because Lebedeff<sup>1</sup> has shown that cylindrical may, in these cysts, become changed into pavement epithelium. For the rare cases in which the cyst is without any epithelial lining, Dr. Graefe accepts Winckle's suggestion, that they may be merely spaces in the submucous connective tissue resulting from œdema, injury, or hemorrhagic effusions. Cysts provided with an epithelial lining he regards as retention cysts, due to occlusion of the orifices of vaginal glands. He accepts the evidence brought forward by Von Preuschen as to the occasional existence of glands in the vagina. He points out that there is a stage in the development of the vagina in which it is lined by cylindrical epithelium, and refers to a case reported by Dr. C. Ruge, in which that observer found a small cyst on the vaginal portion of a fœtus of four months' development. Dr. Graefe therefore puts it, that the membrane lining a vaginal cyst, in producing cylinder epithelium, is "true to its embryonic tradition." There are, however, also cases in which the interior of the cyst presents a structure identical with that of the vagina itself. Of such our author thinks Veit's conjecture a probable explanation, viz., that they are formed out of the remains of the duct of the Wolffian body. Freund has suggested that some cysts may be rudiments of the ducts of Müller; and Dr. Graefe thinks this explanation applicable to one of his cases, in which there were six cysts, arranged in a row one behind the other. Another of his cases, in which there were three cysts, but not serially arranged, he thinks may be accounted for by the combined hypotheses of Veit and Freund.

In the same number of the *Zeitschrift* we find a short paper by Dr. J. Veit, published as a kind of appendix to that of Dr. Graefe, in which is described a case of a vaginal cyst of unusual size, as large as a child's head, projecting from the vulvular orifice in such a manner as at first sight to resemble prolapsus, and above reaching to the broad ligament. Dr. Veit thinks it probably originated in the remains of the Wolffian duct.—*Med. Times and Gaz.*, January 5, 1884.

Etiology of Fungous Endometritis.

A recent number of the *Archiv für Gynäkologie* contains a long, but somewhat theoretical paper by Dr. BRENNÉCKE on the etiology of fungous endometritis, more especially of the form described by Olshausen under the name of "chronic hyperplastic endometritis." The weakness of this carefully written paper is in the small number of cases upon which it is based. Of the disease described by Olshausen, the author believes there are two forms—a glandular, in which overgrowth of gland-tissue is the conspicuous change; and an interstitial, marked by hyperplasia of the connective tissue. Between these extreme forms, other mixed or intermediate cases occur, in which both changes are present. The interstitial form occurs in the younger, the glandular form in the older patients. Dr. Brennecke describes six cases observed by himself, and refers to some other published cases, and upon this material he builds his theory. He finds that in them all the hemorrhage and other symptoms characteristic of the disease were preceded by periods either of complete amenorrhœa, or of irregular, infrequent, and scanty menstruation. Therefore, he says, the disease depends primarily upon a functional disturbance in the ovaries, which, as a reflex effect,

<sup>1</sup> Medical Times and Gazette, 1883, vol. i. p. 13.

causes chronic hyperæmia of the uterine mucous membrane, and thus leads to hypertrophy of that structure. This reflex effect is produced through the nervous mechanism which governs ordinary menstruation, and it therefore affects the body only, not the cervix, of the uterus. Being a disease due to reflex action, it cannot be cured while the cause of the reflex effect remains in operation. Hence, says Dr. Brennecke, the frequency of relapse which is observed in this disease. Our author also adduces the occasional association of abscess of the ovary with this morbid condition in support of his view. For the treatment of this form he looks on the curette, used to remove the hypertrophied membrane, as the grand agent. This should be combined with tonic medication to alter the morbid action which leads to its formation. Cauterization he thinks useless, its adoption being based on an erroneous view as to the pathology of the disease, viz., that it is merely a local change in the uterine mucous membrane. He does not think that this malady ever passes into cancer. The form of disease in which there are localized fungous outgrowths in the uterine cavity, Dr. Brennecke in his experience has always found dependent on some other disease of the uterus; either chronic catarrh (simple or gonorrhæal), retroflexion, stenosis of the os internum or externum, interstitial or submucous fibroids. This form he therefore calls the local uterine form, in contradistinction to the cases of chronic hyperplastic endometritis, which, in accordance with his theory, he calls the ovarian form. He points out these distinctions: 1. In the uterine form there is hemorrhage from the beginning; in the ovarian, menstruation is at first deficient or absent. 2. In the uterine form there is scarcely any tendency to relapse; in the ovarian, a strong tendency. 3. The fragments removed by the curette are smaller in the uterine form than in the ovarian. 4. In the ovarian form these pieces show the structure simply of hypertrophied mucous membrane; this being seldom the case in the uterine form, in which the products of catarrh and ulceration are commonly found. Lastly, Dr. Brennecke describes fungous endometritis following abortion, which he denominates the decidual form. These cases yield the most satisfactory results to treatment, being commonly completely cured by once using the curette. Dr. Brennecke adds to his paper an interesting novelty in the shape of a plate, in which the course of some cases of fungous endometritis is shown in a graphic form.—*Med. Times and Gaz.*, Dec. 8, 1882.

New Method of Partial Extirpation of the Cancerous Uterus.

Dr. ELY VAN DE WARKER, in a paper on this subject in the *American Journal of Obstetrics*, March, 1884, says that at this period the treatment of malignant disease of the uterus is narrowed down to three methods: total extirpation of the uterus through the vagina, vaginal amputation with supra-vaginal excision, and his own method of potent chemical cautery. The first is a method attended with such a ratio of direct fatality and with such mechanical difficulties in the way of its performance that ovariectomy is safe and simple in comparison. The second is simply a survival of the antique. The third, his method, of chemical cautery is as follows:—

The first step consists in amputation of the cervix uteri up to the vaginal junction. The cervix is seized in some portion of its periphery where the tissue is sufficiently firm to hold, with a double volsellum, and the part cut away with a scissors curved on the flat. If the part is very indurated and thick, a knife with a suitable handle is the better instrument. From this point the tissue of the cervix is excised, usually as high as the os internum, in the form of an irregular

triangle, with the base at the vaginal junction. We may do this with either the knife, scissors, or curette, whichever is most convenient. In case the tissues in the cavity of the cervix are very friable, a curette will answer every purpose. With this instrument we may follow the spongy tissue down into depressions of the firmer parts, and then using the scissors, smoothe off the irregularities to a general level. In case of considerable depth of indurated tissue in the cervical cavity, a knife that may be placed at different angles is necessary. Hemorrhage has never given me any serious trouble at this stage. In several cases there has been free loss of blood, which ceased as soon as the cavity was thoroughly cleaned out.

He believes that, in the majority of cases, packing the excavation, after the manner of Sims, with iron cotton as a precaution against hemorrhage, is not necessary, and that we might proceed at once to the second step of the operation, as the zinc solution is in itself a powerful astringent.

When cotton is used it must be promptly removed on the first suspicion of blood-poisoning. Dr. Van de Warker packs the uterus with masses of absorbent cotton about the size of a chestnut, wrung nearly dry from the iron solution, made of one part of subsulphate of iron to three of water. If the cotton is used in small, separate masses, the cavity may be packed without the use of any force, as larger or smaller pieces may be clinked in where they are needed. In removing the iron dressing, these small pieces may be taken away separately with much less force than the large. Very little packing is required in the vagina, as the iron cotton keeps its place very firmly, while filling the vagina adds very much to the discomfort of the patient and prevents the free action of the bladder. The use of carbolized or aseptic cotton in the vagina in no way prevents decomposition. We can, in a measure, avoid blood-poisoning, which is so liable to follow the decomposition of blood-clots saturated with iron, by carefully removing all clots from the uterine excavation, and if we find the blood oozing from between the masses of cotton, remove all the dressing and repack, rather than insure against hemorrhage by imprisoning the exuded blood, by packing the vagina, as the blood is sure to decompose and prove the source of a vile odour, if not of absolute danger.

The dressing ought to be removed by the second day. This is done more readily with a tenaculum with a short, right-angled hook. Here the chief advantage arises of using small masses of the iron cotton, as each one may be caught up on the tenaculum, and removed separately without any force. The patient should be placed upon the table in a good light, as the vagina will be found discoloured by the iron, and very much contracted. When the vagina and uterine excavation are properly cleaned out, the patient is ready for the real operation, compared to which all that has gone before is subsidiary and of minor importance.

Dr. Van de Warker makes use of two strengths of the zinc chloride solution, one of 3v to the ounce of water, and one of equal parts of the chloride and of water, by weight. The zinc solutions, about an ounce of each, in salt mouth bottles, are marked so that there may be no doubt which is the stronger. A pomade of bicarbonate of soda in vaseline, about one to three, and a thirty-percent. solution of the same salt in a goblet. An assistant accustomed to hold a Sims speculum is very necessary. After the dressing of iron cotton is removed, he cleans and dries the vagina and excavation with absorbent cotton, and then carefully protects the labia and vagina with the pomade of bicarbonate. The comfort of the patient for two weeks or so depends upon protecting the labia, and, especially, the urinary meatus, from the action of the caustic. Since using

the vaseline pomade, he has had no trouble. How are we to determine whether we will use the weak or one-hundred-per-cent. solution? This point is determined at the completion of the preliminary operation. By introducing a blunt sound to the fundus of the bladder, and with the finger passed into the uterine excavation, he endeavours to feel the sound through the intervening part, and thus estimate the amount of tissue left for the caustic to act upon. The posterior relations of the cavity are judged of in like manner, by passing the sound into the uterine excavation, and with a finger in the rectum, if the interlying part is very thin, the sound may be felt. It is better to do this before the excavation is hardened and contracted by the iron. If, then, we have approached quite near the surface of the uterus, so that a slough in excess of a quarter of an inch in thickness is liable to result in perforation, it is prudent to use the weak solution after the upper and thicker-walled parts of the excavation have been packed with the strong solution. If the vaginal wall was involved and worked down with the curette, it is possibly better to use the weaker mixture for fear of perforating into the bladder or rectum, although he has applied the one-hundred-per-cent. solution upon the vagina without accident. Usually, we need not hesitate to expose the surface operated upon to the full strength of the caustic. After the packing is completed, the surface of the zinc cotton and about an inch of the upper vagina is filled with absorbent cotton saturated with the bicarbonate of soda solution, by which any of the chloride of zinc that may filter out is decomposed.

In some instances, the pain is not severe. One or two full doses of morphia, hypodermically, are sufficient to bridge over the period of pain, which usually does not exceed ten hours. In about two or three days, we may remove the cotton from the vagina, and, if we can do so without force, from the uterine excavation. If the zinc dressing is thoroughly cemented down, it is better to wait a day or two longer. When it is removed, a white, firm, cement-like surface, which is the slough firmly adherent to the excavation, is brought into view. The slough will separate in from five to ten days. No force at any time should be used to detach the slough, but it must be allowed to exfoliate spontaneously. If the one-hundred-per-cent. chloride solution has been used, it is thrown off in a single piece, an exact cast of the cavity. There is no danger of blood-poisoning during this stage, as the chloride is a perfect disinfectant. While the slough is separating, we may aid the process by a free douche of carbolic acid solution, which may be continued during the granulation process.

It is during the sloughing stage that we may be annoyed by hemorrhage. He guards against it by confining the bowels for four or five days, as then there will be no cause for expulsive effort upon the bed-pan. The patient is cautioned against sitting up in bed or making any considerable effort to help herself. It is better to empty the bladder through the catheter at this time, as patients get to be very careless if allowed to help themselves. On several occasions, he has seen hemorrhage follow directly after using the douche. This, he thinks, was owing to the force of the current into the excavation. None but the gentlest stream must be used, and, if hemorrhage should follow, stop the injection for a day or two. In cases in which the destruction by the caustic of the muscular tissue of the uterus has been extensive, there has been less hemorrhage than in cases in which a considerable part of the substance of the organ was intact. In one case, in which he had reason to believe, from the shape and quantity of the slough and the depth and breadth of the excavation, that the entire uterus had been shelled out of its peritoneal envelope, there was only a slight hemorrhage on the sixth day, caused by the patient getting up and sitting upon the commode.

The hemorrhage ceased spontaneously. He has never been obliged to pack the vagina to arrest hemorrhage. An injection of a weak subsulphate of iron solution has always promptly arrested it. It is not a good form of astringent to use, however, as the bed is liable to be damaged. Vinegar or a solution of alum would be just as efficient, and without this disadvantage. The use of vinegar would not constrict the vagina, and thus allow one to pack in case this became necessary—a very difficult thing to do after an iron injection.

Cicatrization is completed in from two to four weeks, leaving a greatly contracted cavity lined by a pale, soft, velvety membrane free from odour or discharge. The cavity continues to contract for some time after the granulation process is completed. Contractions such as this would follow no agent other than a caustic. It is an endowment of cicatricial tissue from this cause to undergo this progressive shrinkage, as the deformities from severe burns prove.

Three cases are reported which illustrate the various methods of the procedure.

The Complications of Cancer of the Uterus.

In a recent paper on this subject MM. FÉRE and CARON give the results of 51 autopsies made in 1881, 1882, and 1883 at the Salpêtrière. Cancer of the uterus is certainly a frequent disease, and the study of its complications has not been neglected by writers on the subject.

Of 51 cases of cancer of the uterus there were: 1 case of primary cancer of the uterine body with complete integrity of the cervix; 3 cases which had wholly invaded the body and cervix; 47 cases in which the cancer, having destroyed the whole or a part of the cervix, had invaded more or less of the isthmus and the lower part of the uterine body.

The complications observed may be grouped in the following manner:—

I. *Lesions of Contiguity.*—a. *Invasion of the vagina.* In 35 cases the vagina was invaded to a greater or less extent, and in some cases as far as the vulva. b. *Invasion of the bladder.* In 27 cases the uterus was adherent to the posterior wall of the bladder; in 18 the bladder communicated with the vagina, and the trigonum was completely destroyed in six cases. The bladder in every case was more or less thickened, indurated, and mammeloned; there were also vascular ramifications around the urethra; in 1 case there was in the vicinity of the urethra true thrombosis of two veins, each containing a yellow clot. In one case the bladder was studded with small transparent miliary cysts which gave a violaceous colouring to the mucous membrane. c. *Invasion of the rectum.* In a certain number of cases there were adhesions with the rectum; in 7 there were communications with that organ, and in one of these cases there was a second communication with the small intestine. In another case there was an induration of the rectum to the extent of four inches, and, in the centre, a spot of softening whence two fistulæ extended into the perineum. Rupture of these adhesions to the rectum caused death in 3 cases by setting up a purulent peritonitis. d. *Peritoneal lesions.* General peritonitis has been found in 9 cases.

II. *Propagation to Ganglia.*—The ganglia of the large ligaments were seriously involved in 9 cases; in another the sacro-lumbar ganglia were involved; in still another cases there was a chain of cancerous nodules along the psoas muscle.

III. *Generalization.* Five cases.—In one case the intestinal walls were studded with miliary cancerous nodules. In the second there were also three cancerous foci in the left lung. There were 10 or 12 nodules, as large as a hazel-nut, in the liver, which was hypertrophied and cirrhotic. There was a

nodule in the heart, as large as a chestnut, indurated, developed in the wall of the right ventricle, and projecting into the interior of the ventricle by several small vegetations ulcerated at the summit. The uterus was completely invaded, the bladder was involved, and the whole pelvis was filled by a hard, irregular mass of fibrous aspect. There was also a cancerous pelvic peritonitis. In the third case the cervix and the isthmus were destroyed, and the recto-peritoneal cul-de-sac was filled with cancerous nodules. The cæcum was the seat of a cancerous mass which had destroyed the ilio-cæcal vulva. The whole abdominal cavity was filled with small cancerous nodules situated in the epiploon, the mesentery, and the intestinal loops. In the fourth case there was cancer of the left parietal bone, small cancerous spots in the pleura, a cancerous mass of the uterus which had destroyed the cervix, and cancerous nodules on the mucous membrane of the base of the bladder, and a few nodules on the upper surface of the diaphragm. In one case there was an encephaloid tumour of the right ovary as large as the head of a fœtus.

IV. *Lesions of the Urinary Passes of Mechanical Origin.*—There was, in 21 cases, dilatation of both ureters; in 19 cases, dilatation of one alone, nine times on the right, and ten times on the left, followed by dilatation of the calices and pelves, double in 21 cases, and on one side only in 16, nine on the right, and ten on the left.

These dilatations, caused by more or less slow occlusion of the ureters, caused hydronephrosis in the majority of the cases; in other cases there was pyelitis, with 7 cases also of suppurative pyelitis. In 2 cases there were calculi in the calices, the pelves, and ureters. There were also kidney lesions; in the greater number of the cases the cortex was sclerotic. In 7 cases there was double interstitial nephritis, and 17 cases in which the lesion existed only on one side; in one case the kidneys were the seat of numerous small cysts. In 7 cases there were miliary abscesses of the kidneys.

V. *Cardio-Vascular Lesions.*—There were 2 cases of thrombosis of the iliac veins; in 3 cases there were thrombosis of the Sylvian artery and cerebral softening. In 8 cases there were traces of recent intra-cardiac lesions, and condylomatous vegetations with or without vascularization of the valves. The cardiac lesions only existed in cases in which there were renal lesions.—*Progrès Méd.*, Dec. 29, 1883.

Three Cases of Pyosalpinx.

At the meeting of the Obstetrical Society of London, on Nov. 7th, Mr LAWSON TAIT related three cases of acute peritonitis, due to pyosalpinx, cured by abdominal section, removal of the diseased appendages, cleansing and draining of the peritoneum. The first case was one of chronic pyosalpinx made acute by a stem pessary. The tube burst, and acute peritonitis followed. Abdominal section was promptly performed, and the patient saved. Mr. Tait quoted the remarks of the gentleman who sent the case to him, as to the effect of the mechanical treatment in causing the disease, the difficulty in discriminating the cases suitable for treatment by stem pessaries, and the dangers of these instruments. The second case had already been published in the *British Medical Journal* of February 17, 1882, and was brought forward here for the purpose of recording the subsequent history, which was that all the symptoms had vanished, and the patient was now perfectly well. The third case was one of purulent peritonitis arising from rupture of a suppurating Fallopian tube. The pyosalpinx was due to gonorrhœal infection. The left tube only was removed. The patient recovered completely. Mr. Tait had now operated on sixty-five cases of oecu-

sion and distension of the Fallopian tube without a death. In only one had there been failure to completely relieve the patient's sufferings. Six cases had been lost sight of, and two had died since the operation, from causes independent of it. The author remarked that cases such as these could not be relieved by anything short of removal of the diseased organs; and that they existed in large numbers, forming a large portion of the cases which wander about from one practitioner to another, seeking relief. He also complained of some unjust and ungenerous criticisms which were frequently repeated to him, and he asked those who expressed such views to come and see his work.

Dr. WYNN WILLIAMS protested against the use of a stem pessary in such a case as the one related. If harm followed the use of a stem in such a case, the blame should be laid on the practitioner, not on the instrument. He presumed the pyosalpinx was not attributed to the stem, as it must have been there previous to the insertion of the instrument.

Mr. DORAN believed that suppuration of the Fallopian tube was sometimes caused by the introduction of a dirty sound into the uterine cavity, conveying septic matter therein, and setting up a low form of inflammation.

Dr. W. A. DUNCAN asked whether, in many of his cases, the tubes were fixed by adhesions, and, if so, whether the operation was made much more difficult? He had recently seen two cases of pyosalpinx; in one, the left tube ruptured into the vagina; in the other, a very characteristic left pyosalpinx entirely disappeared.

Dr. GERVIS thought that Mr. Tait took somewhat too gloomy a view of the prognosis in cases of tubal distension. Some cases, possibly of hydrosalpinx, certainly got better without operation. He thought that whatever induced endometritis might lead to tubal inflammation. He asked for further information as to the diagnosis of these cases. He thought that this operation, though the latest, was not the least important of recent advances in abdominal surgery.

Mr. KNOWSLEY THORNTON asked for the respective numbers of the cases of hydrosalpinx and pyosalpinx. He could not admit that hydrosalpinx was a grave condition; he had met with it often in performing ovariectomy, and believed that its bursting caused little or no disturbance, and was a common mode of its natural cure. Pyosalpinx was more serious, but he believed it was often cured by discharging into the uterus. The distinction between these two conditions was, therefore, of much importance, and he asked for information as to the diagnosis between them. He had twice operated for pyosalpinx, and in neither case were there more than slight adhesions.

Dr. MATTHEWS OWENS had seen some fifteen of these operations, and could vouch for the great good done by them. He believed that many cases of so-called hysteria would now prove to be due to disease of the Fallopian tube. He mentioned a case in illustration. Such cases were not recorded in post-mortem records, because they were put down as peritonitis. The difficulty of diagnosis of these cases was a drawback. But the risk of an exploratory incision was *nil*, and the result, if pyosalpinx were found, brilliant.

Mr. LAWSON TAIT said that the words condemning the stem pessary were not his own. He had known gonorrhœa given by a dirty speculum, and thought it might be given by a dirty sound. If he were called to a case of puerperal peritonitis sufficiently early to promise a good result, he would open the abdomen, wash out and drain the cavity; but as yet he had not had a chance of doing this. He had no doubt that many cases of hydrosalpinx and some of pyosalpinx were cured by natural processes. In diagnosis, he depended largely on the history, which started from an inflammatory attack. There was more or less con-

stant pain, aggravated by movement and by intercourse, and menorrhagia; and there were physical signs of pelvic changes. Errors in diagnosis occurred in his practice about once in ten times, and were always instructive. He mentioned cases in which he had taken for pyosalpinx a small dermoid cyst. In these, the initial point in the history was the only thing wanting. Cases of pyosalpinx were not seen in hospital post-mortem rooms because they commonly died from peritonitis too quickly to come into hospital. They were, however, exceptionally seen in hospitals. Hydrosalpinx and pyosalpinx occurred in his practice, he thought, in the proportion of about three to two. Hydrosalpinx was not dangerous to life, but often caused intense suffering, and therefore he did not hesitate to remove it. He did not think its rupture ever likely to prove fatal. The differential diagnosis between the two could not be made. He used a glass drainage-tube and washed out the abdomen with plain water. He expressed his gratification at the reception of his paper.—*Med. Times and Gaz.*, Dec. 1, 1883.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Suicide by Pistol-shot without External Wound.

Dr. FRANK OGSTON reports, in the *Edinburgh Medical Journal*, Feb. 1884, a most remarkable case in which a man committed suicide by shooting himself in the mouth, and in which no external wound was made.

The lips, externally as well as internally, were quite uninjured. The whole of the interior of the mouth was blackened. A blackened groove, a quarter of an inch in breadth and depth, ran along nearly the whole dorsum of the tongue. The velum palati perforated by a round hole, nearly a quarter of an inch in diameter, exactly in the central line and near its lower margin. The basilar process of the occipital bone presented a similar perforation just in front of the foramen magnum. The bullet had then traversed the medulla oblongata, and striking the inner side of the occipital bone at its thickest part, the internal occipital protuberance, had glanced off and run through the brain from the left side of the base of the cerebellum, traversing the right lateral ventricle, and issuing from the cerebrum between the third and fourth right frontal convolutions; then, apparently its velocity almost spent, it had spun backwards over the surface of the brain, and was found in a mass of bruised and broken-down brain matter underneath the dura mater, over the fissure of Sylvius on the left side, near the superior longitudinal sinus.

Beyond the perforations above described, the bones of the skull showed no mark of the bullet, and were quite uninjured. The bullet was battered almost out of shape, but its base retained still enough of its original form to admit of its identification, as it nearly fitted into the copper capsule out of which it had been fired, which was found in the revolver.

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